

For Curing
A P O L L O M A T H E M A T I C U S :

OR THE *Adams 8. 69. 73*

A R T
OF CURING
DISEASES
BY THE
Mathematicks.

According to the Principles of
D^R. P I T C A I R N.

A Work both Profitable and Pleasant; and
never Published in *English* before.

To which is subjoined,
A Discourse of C E R T A I N T Y, according to the Principles of the same Author.

*Qui Bæviæ non odit, amet tua carmina Mævi,
Atq; idem jungat vulpes, & mulgeat hircos.*

Printed in the Year, M. DC. XCV.

APOLLO MATHEMATICUS.

OR THE

A R T

OF CURING

DISEASES

BY THE

Mathematicks

According to the Principles of

DR. PITCHAIRN

A Work both Profitable and Pleasant; and
never Published in English before.

To which is subjoined,

A Discourse of CERTAINTY, according to the Principles of the same Author.

And a new method of curing the Venereal Disease, and other dangerous Disorders.

Printed in the Year, M. DC. XCV.

TO THE READER.

Reader,

I Here present thee with a short System of Mathematical Medicine; a Work altogether New, extracted out of the Writings of that Learned and Eminent Mathematician and Famous Physician D. P. late Professor of Medicine in the University of Leyden. To him alone is due the Glory of this Invention: and he it is that first laid the Foundation of this Aereal Castle: and he only is able to finish the Building; and bring this great Work to its wished Perfection. If thou reap any Advantage by this Treatise (as Phoepe thou shalt) thou knows to whom Thanks is due. Yet I cannot but say, that the Translator deserves some small tribute of Praise; for had it not been for him, it might have lyen buried for ever in the

Ruines of old Rome, out of which he has dig-
 ged it with a great deal of Pains and Care;
 and so been the happy Instrument by which
 this great Blessing is conveighed to all these
 of this Island, who understand not the Lan-
 guage of the Beast. Tho' this Work may just-
 ly be called New, having never been brought
 to any tollerable Perfection before; yet it was
 attempted of old by that Famous Mountebank
 Crinas Massiliensis, who was so precise and
 exact in his Patients Diet; that he would not
 allow them to Eat or Drink, but with regard
 of Times and Seasons, observing the Course
 of the Stars, choosing good Days and Hours,
 and walking always by his Almanack and E-
 phimerides, and all this by his great skill in
 the Mathematicks. But Mountebank as he
 was, he turned Thessalus, as great a Quack
 as himself, out of the Sadle, Cum arte ge-
 minata ut cautior religiosorq, ad syderum
 motus ex Ephemeride Mathematica cibos
 dando, horasque observando autoritate
 eum præcessit: And found a way by his Ma-
 thematical jugler Tricks, to live like a Prince,
 and leave a good round Sum to his Heirs.
 This Fellow at best was nothing but a cunning
 Rogue

Rogue, and believed no more that Mathematicks were of any use in Medicine, than I believe that the Moon is a Cheshire Cheese; but only made use of them as a Trick to get Money. But here you have this Doctrine seriously inculcat, and supported with all the Reason it is capable of, and Prophecy too. You have not here a meer Theory and abstract Speculation of this Mathematical Medicine, but many practical Conclusions regularly deduced, and several particular Cases handled. But Reader, that I may not forestal thy Judgement by a too high Commendation of this Work, I will say no more, but recommend to thee to read impartially this little Treatise; by which thou shalt be able to judge of the real worth of this New Medicine, and of the Benefits will accrue to Mankind by it. I have subjoined to this, A Discourse of Certainty, according to the Principles of the same Learned Author; which is every whitt as good Divinity, as the other is Physick. The one without the other would have been but lame and defective: But both together make a compleat Work.

FAREWEL.

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Or the

A R T

Of Curing

D I S E A S E S

By the

M A T H E M A T I C K S.

NOTHING can be more destructive to Learning in general, or hinder and obstruct the advancement and progress of any Art or Science in particular (especially that of Medicine) than wrong Methods, and false and mistaken Notions. For these like *ignis fatuus*, or *Willawisps*, lead Men out of the beaten Path and the King's High-way, into By-ways and untrodden Paths,

Paths, where they can hardly shun falling
into Bogues and Ditches. Men for the most
part love Extreame, and as the Poet saith,

Stulti dum vitant vitia in contraria currunt.

Fools while they do one Danger shun,
Always into another run.

The Way to true Knowledge is strait and
narrow, and there are Dangers on the
right Hand and on the left, and he that
would escape both must keep the golden
Mean, and steer a very steddie Course,
neither standing too far out to Sea, nor
keeping too near the Shoar. For whether
we be swallowed up in the Deep, or Ship-
wrak'd among Rocks and Shelves, it's much
the same thing. And therefore,

He that the golden Mean would keep,
Must not launch out into the Deep,
Nor always keep too near the Shoar,
Where Waves 'mong Rocks and Shelves do
For whether we perish in the Main [roar,
Or near to Land, it's much the same.

Some admire the Ancients too much, and
others too little. The former are so mad

in love with Antiquity; that nothing will relish or go down with them, that is not stale with Time, and seasoned with the Salt of old Age: The Later nauseat whatever is not of Yesterday, as musty and corrupt, and can digest nothing, but what is dressed with the Sauce of Novelty. As the First have but a very weak Stomack and bad Digestion; so the Last have a depraved Appetite and vitiat Pallat. Those for the most part are Men of a morose Temper and severe Brow: these have light Mercurial Noddles, are unstable as the Water, and tossed about with every Wind of Doctrine. Both the one and the other may be known by their Way, as the Virtues of some Herbs by their Signatures. There a *Spanish* Gravity, and here a *French* Levity; the One for the most part of the same Mind, the Other scarce two Hours of the same, or two Minutes in the same place: Every Thing purs them by their Mind, and every new Object captivats their weak Fancy. Something may be made of the First, because they are naturally fixed: But the Second are fit for nothing

thing but to be Weather-cocks: Nothing can fix or settle them but old Age and Time; and then for the most part it is out of time: For when the Spirits are evaporat they become silly and dull, as Wine when it is over fermented or fretted grows vapid, and is good for nothing. Both Extrems then must be shunned, and we must choose the middle Way: admire the Ancients, and justly esteem the Moderns; they laid the Foundation, and we must rear the Fabrick after the Model they have given us, if ever we design to make a regular piece of Work, and finish the Building.

But among all the mistaken Notions and false Ideas of Medicine I have met with, there is none so ridiculous and absurd, as that of a late Sect that is sprung up among us, like *Jona's* Gourd in a Nights time, and I believe will wither in another. This Sect I call the *Mathematical*, to distinguish it from the other Sects of Medicine, the *Empirical*, *Methodical* and *Rational*. Its chief Patron is one D. P. an expert Physician, and learned Mathematician.

ian. This learned Man will needs have the knowledge of the Mathematicks necessary for Physicians, not only as an Instrument to digg and prepare our Minds for the Seeds of all Arts, as well as this of Medicine (which is a Mistake many have fallen into more than he) but as having an Affinity and peculiar Congruity with it, and without which it can never be cultivated as it ought, or bring forth Fruit, Twenty, Thirty, or an Hundred fold; no more than Corn can grow without the Dew of Heaven and benign Influence of the Sun. But whatever be in this, that Mathematicks are necessary for a Physician, I am sure Physick is very necessary for some Mathematicians, and that a good swinging Dose too. But that you may not take this for a Romance (as readily a wise Man will) I shall cite you two or three Testimonies of the Dr's. that in the Mouth of these Witnesses the truth of what I say may be established.

The First shall be that at the end of his Dissertation, *de circulatione sanguinis in Animalibus genitis & non genitis.*

Nunquam excoletur praedignitate Medicina quamdiu intra limites Rationalis illius exercetur, aut quamdiu praeter vires hactenus Medicinam receptas, aliae Philosophis praesertim Peripateticis huc usq; ignotae & a Mathematicis inventae, methodoque hisce nota inveniendae non recipiuntur.

I confess ingenuously I can hardly either make good Sense, or good English of this Passage. But if I be not mistaken, the meaning of it is this. That Medicine can never be polished as it ought to be, or brought to that perfection it is capable of, so long as it is confin'd within the narrow limits of that we call *Rational Medicine*, or as long as beside these already received into Medicine, other Powers or Properties (call them as you please) which the Philosophers have hitherto been ignorant of, especially the Peripatetics, & found out by the Mathematicians and that only can be found out by a Method known to them, are not received.

The Second is in the Sect. 17. of his *Dissert: de motu sanguinis per vasa minima*. Neque dissiteor non alio magis nomine arridere mihi *Artem Medicam quam quod methodo*
 geo-

*ometricæ possit morem gerere, uti ea omnes
resiquæ corporum vires & naturas explo-
rat. i. e.* I confess that nothing makes
Medicine more acceptable to me, than that
it can be subject to the Method of Geome-
try, as all these Arts that search out the
Virtues and Natures of Bodies.

The *Third* and last, is at the end of his
augural Oration, where he tells us, That
he does not wonder that the Physicians
etc ignorant of the physical Causes of
these Diseases: *Non tamen existimo* (says
he) *me non explicasse causas illarum seu Ma-
thematicas seu Medicas, nempe eas quarum
cognitio est Medicis utilissima. i. e.* Never-
theless, I think I have explained the Ma-
thematical or Medical Causes of them, *viz.*
these Causes, the knowledge of which is
very useful and profitable for Physicians.
I doubt not but these Testimonies will
sufficiently convince you of the truth of
my Assertion, and that this Mathemati-
cal Medicine, which is as great a Bull as
I know, is none of my calving.
Is there any thing so absurd or ridicu-
lous, that some Men will not maintain?

And

And which is more, that will not get some footing in the World, if it be set off with an Air of Impudence and Novelty? Was ever any thing more absurd and contradictory, not only to it self, but to the common Principles of humane Nature, than the *Epicurean Philosophy*? And yet how greedily it was suck'd in, in the beginning and how that Herd has multiplied and increased since, every Body knows: But the belief of *Transubstantiation* puts the Matter beyond all doubt.

Before I come to Examine this learned Man's Scriblings in particular, where the Picture of this *Chimera* is drawn to the Life, I shall consider the common Plea and weigh, in a just Ballance, the Reasons of these Pretenders, some whereof I have had occasion to discourse with.

Is not (say they) the Body of Man a *Machine* or *Automaton*, whose Nature and Essence consists in the Form and Figure, Motion and Rest, Symmetry and Proportion of the Parts, &c. which only can be defined by the Mathematicians? And no Man can pretend to mend a Watch we

who does not understand its Nature, and how it is formed and put together; so no Man should take upon him to Cure Diseases without the knowledge of the Mathematicks. Who can say this is not a just parallel, since the Lines, though drawn out infinitely, will never meet to all Eternity? Or who can refuse this for a Demonstration, since I'll warrant it for as good as any of the Doctor's I am to examine afterwards? Who doubts but the Body of Man, in some sense, may be called a *Machine*? Yet it is of such a wonderful Structure and curious Contrivance (for we are wonderfully made) has so many small Parts and Springs, such variety of Motions, &c. that none either knows, or can know, but the Great Artificer that first made it, and set it a going. All we can do is diligently to observe its natural Motions, and take notice what disturbs their Regularity, and endeavour to find out by Experience, assisted with Reason, what may put it right again. And this I think may be done without the Mathematicks. As for Example, Men found that

raw

raw Meat troubled the Stomack, and was of hard digestion, and therefore they tryed it boyld and roasted, &c. and found it did a great deal better. They found likewise, that that which was agreeable to them, and of easie Digestion while in Health, would either not go down, or increased their Disease, if it did, when Sick; and this taught them the use of Broathis, Ptisans, &c. And thus came in the Dietetick Part of Medicine. Moreover when any intestine Commotion was raised by Surfeit or Drunkenness, they found, that upon the expelling the Enemy, the War was at an end. And thus they learned the usefulness of Vomiting, Purging, &c. When in Fevers or violent Head-acks, &c. the Nose fell a Bleeding, the Fever abated, and the Pain evanished. And thence they learned the use of Blooding. And thus came in the Pharmacutick, or Curative Part of Medicine. And all this without so much as once dreaming of Mathematicks.

These were the First Lineaments and ruder Draught of that Noble and Excellent

Art

Art. But something was still a wanting to finish the Picture, and this was Reason, without which bare Experience more frequently hurts, than helps. This is that which weighs all in an equal Ballance (without the assistance of the Staticks) considers all the Indications and Contre-indications, arising from the Nature of the Disease, the Causes and urgent Symptoms, the Age and Constitution of the Patient, the Season, Sympathies and Antipathies, &c. And there is no Mathematicks in all this. Moreover this *Machine* is of a quite different nature from artificial Ones, which can be taken down and set up again at One's pleasure; and by this means soon mended when any thing is amiss: But such an Experiment as this, I doubt would prove a little too dangerous on the the Body of Man: For tho' it is easie to take it down, all the matter is to put it together again, and set it a going. I would advise these Mechanists to try the Experiment first on some of themselves: For there is reason to suspect that something is wrong in their Clock-work that reason thus, and if it

ſucceed well, they need not doubt of Practice. And for their encouragement, I propoſe to them the Example of that famous Witch *Medea*, who alſo tried it firſt on a Sheep which ſhe diſmembred and boyled with certain Herbs, that were under the influence and dominion of ſuch and ſuch Planets, whoſe nature and motions are only known to the Mathematicians.

Did ever any thing more wild or extravagant enter into the Mind of Man, than to imagine that this ſpeculative Science, that goes all by Demonſtration, ſhall be of uſe in a practical Art founded on Experience? In which there are no infallible Concluſions, either as to the Event or Cure of Diſeaſes, but only high Probabilities and rational Conjectures, as in other practical Arts, ſuch as War, Agriculture, Politicks, &c. and which without Revelation, are capable of no more. Which *Kerkringius*, in the Preface to his *Specimen Anatomicum*, has expreſſed very well thus. *Nam eas qui ſibi ita placent in ſua Mathematica, ut etiam Medicinam velint*

lint ad ejus leges revocare, nihilque tentari a Medico antequam illud & faciendum esse & aliter fieri non posse demonstraverint, tanquam ineptos homines a medicandi Arte præstantissima rejiciendos censeo. Ego certe citius eos insanire Mathematicè demonstrare vero quam illi probaverint artem hanc practicam, & quæ non exigua est ejus laus, divinatoriam, ad Mathematicorum leges revocandam esse. Non potest revocari omnium Regina Artium Politica, non debet Medicina: agendum in utraque est ex prudenti judicio, & servanda respublica, ægerque sanandus est antequam pereant, dum illi suos quærent quos nunquam invenient calculos, quosque quærendos esse gratis assumunt, & prudentium omnium in gratis.

But since the thing is so ridiculous and absurd, what can be the ground of such a Belief? You know that the Sectaries that break off from the Church, since they have no pretence to Reason, are forced to have recourse to pretended Inspirations and Revelations: So here I see nothing can support this tottering Sect, but this old Prophecy of Sybilla.

*Tempus enim veniet quo si non fallit Apollo,
Clara Caledoniis fulgebit stella pruinis,
Quæ rectum monstrabit iter qua ad templa Mi-*
[nervæ

Ire licet, tenebras istisq; fugabit ab oris :

Artis Apoloneæ nec non arcana recludet.

*Tunc homo Nestoreos sanus durabit in annos
Arte Mathematicæ : nam sic cecinere Sybillæ.*

The time will come, if great Apollo
Prove not an idle lying Fellow,

As he has done many a time,

In Scotland a bright Star shall shine,

That shall thence Darkness drive away,

And to true Wisdom shew the way,

And Physick's Secrets all display.

Then Men shall live as long as Nestor

By Purging, Vomiting and Clyster,

Prescrib'd by Mathematick Art.

Thus Sybil iung, then let a F---

Here is a Prophecy that fortells clearly
that such a thing will come to pass, and
that he by whom this great Blessing shall
be conveyed to Mankind, shall be Born
in this Countrey, without giving notice
who the Person is, or when the time of
his

his appearance will be. For this lyes still
 wrap'd up in the depth of Destiny, which
 only time will discover and bring to light:
 But I pretend no great skill in Prophecies:
 You may consult, at your leisure, these
 that have commented on *Merlin*, *Thomas*
the Rymer, *Mother Shipton* and *Mother*
Gregg, who may be able to give you some
 light in the matter. I wish with all my
 Heart it might be fulfilled in my time!
 What satisfaction would it be to me, to
 see some old Physicians go to School a-
 gain, and come under the *Ferula*? I should
 even be ready to split my Lungs with
 laughing, to meet them with *Apolonius* Co-
 nicks and *Des Cartes* Analyticks under
 their Arm, going to get a Lesson from
 the Professor. But that which would
 compleat the Farce, would be to see *Mes-*
sieurs les Apothecaires trying their Intrants
 in reading Receipts by *Euclid's* Elements,
 the Mathematicians Dispensatory: And
 ordain that no Clysters should be admini-
 stred but by Syringe, which is a Cylin-
 der, as every Mathematician knows.

I confess you may think this but a very weak Foundation to support such a Fa-
brick : But weak as it is, it is sufficient :
For Castles in the Air need no Foundation
at all.

I hope you will not mistake me, and
think that I have any quarrel with the
Mathematicks : For that were both unjust
and unreasonable in me, as having never
got Good or Hurt by them in all my
Life : And if I had received any Injury,
I am sure you are so charitable as to think
I would have forgiven it. It is not the
Use, but the Abuse of the thing I com-
plain of : For which I ought no more to
be blamed, than he that condemns Drun-
kenness, tho' the Wine were never so good.
For it is one thing to take a little Wine
for your Stomack's sake, and another to
sweem in the blood of the Grape ; the one
will refresh, and the other may chance
to choak you. What greater abuse than
to intrude this upon other Arts, to which
it has no more relation or affinity, than
Musick has to Painting, or Colours to
Sounds ? The Mathematicks deserve their
room

room in the World and Common-wealth of Learning, and are very good Neighbours, while they keep within the bounds prescribed them by Nature, and do not wander beyond the limits of their own Orb: But if they come to make Incursions on the Territories of another Vortex, they may chance to share with the Comets in their fate. *Oportet vivere convenienter Naturæ*, says the wise Stoick. Every thing has its Limits fixed by Nature, which it should not pass. Property is that which makes Kingdoms & States flourish in Wealth, Peace and Honour: And if that be taken away, all goes to ruine. And the Paralel holds exactly well in the Common-wealth of Learning: For Divinity, Medicine, Law and Mathematicks, have all their distinct Provinces, and may live very well in Confederacy together, but can never be subject to one anothers Laws. But if any Man will needs join what Nature has divided, I wish him Joy, and conclude with the Poet.

Atq; idem jungat vulpes & mulgeat hircos.

Hitherto I have been but skirmishing, and beating some of the advanced Guards; but now I am come up to the main Body, where I must fight every foot of Ground, and force the Camp; which you need not doubt is very regularly fortified: But whatever be the event, one thing I am sure of, That I shall either die in the Bed of Honour, or ly in its Truckle-bed.

I proceed now to examine what the Dr. has said in particular on this Head, whether in his *Oration* or *Dissertations*. And I wish with all my Heart the Contrroversy were to be determined by these, and he to be tried by his Works. But I am persuaded no reasonable Man will decline such a Judge, and therefore I go on.

The *First* that presents it self, is the *Inaugural Oration*, a piece of Work that all the Mathematicks, in the World can never bring under the Laws of Rule and Compass, either as to Matter or Form. It is here where the Plan of this magnificent Structure is drawn so well, that it may pass for an Original that can never be imitat. I must confess ingenuously, that

that I have viewed it on all Quarters, and taken the prospect of it on every side, and can find no uniformity in it but that of Nonsense; in which all the Parts so wonderfully agree, that one would almost swear that it had sprung from the fortuitous Concourse of Atoms. I had once designed to put it into *English Burlesque*, for me thinks such a Fool's Coat would have fitted it very well: For then be sure it would have been Rhime, whereas now it is neither Rhime nor Reason. A Digression here and there is the Embellishment and Beauty of a Discourse, and sets it off as Patches do a fair Face; and even *Venus* her self is drawn with a Mole. But if instead of a Patch, one should apply a Plaster over the whole Face, who would not cry out?

Monstrum horrendum informe. Ingens cui lumen ademptum!

I have many times wondered with myself how any Man of common Sense could have the Confidence to pronounce such a piece of Gibberish, before so learned an Au-

Auditory as the University of *Leyden*: till at last I found out the Knack, which is, That *Holland* being a free State, Men are allowed there to use their Tongues freely, either in Sense or Nonsense, without trouble or molestation, providing they do not disturb the publick Peace.

The design of this *Oration* is High and Noble, no less than establishing Medicine on a sure and lasting Foundation, that cannot be shaken.

----- *Quod nec Jovis ira, nec ignis,
Nec poterit ferrum, nec ævi abolere vetustas.*

For hitherto it has been floating upon Water, and been more like to an enchanted Island, or Farie-land, than *terra firma*. Hitherto it has been a *Conjectural Art*, and now it will prove a *Certain Science*.

Bnt before the Professor lay the Foundation of this *Babel*, he, like a wise and skilful Architect, removes the Rubbish out of the way; he shows us what hitherto has obstructed this great Work, and frustrat the Endeavours of so many learned Men that aimed at the perfection of this Art so beneficial to Mankind.

I hope no Body expects that I should follow any regular or artificial Method in tracing this *Oration*; but rather that I shall do as these who go a Hunting, leave the beaten Road, and follow the Chace through Hill and Dale, Mountain and Valley, Moss and Moor, as the Beast shall chance to take its way.

I find then the Rock on which all the Physicians has split, is Philosophy: For whenever this got into Medicine it spoiled all, and the Physicians divided into as many Sects as the Philosophers, every one setting up a different Hypothesis, according to the Philosophy he valued most, whether the Platonick, Peripatetick, or Epicurean, &c. and now of late the Cartesian: And so every one explained the first Principles of natural Bodies, and their Actions and Operations, according to his own Hypothesis: Whence came in the Doctrine of Physical Causes, about which these Philosophical Physicians were at a perpetual scuffle. *Hinc illæ lachrymæ.*

Now here is the Disease, but where is the Cure? Many hitherto have attempted

it, but all in vain: Till at last the Professor fairly undertook it, which I wish prove not worse than the Disease. Medicine must then be separat from Philosophy, and emancipat from the Tyranny of all its Sects, and broughr under the Dominion of the Mathematicks: And therefore Physical Causes that disturb the Common-wealth of Medicine, must be expelled its borders, as Disturbers of the publick Peace, and a new Colony of Mathematical Causes, these Bulls, or rather Monsters in Medicine, must be planted in their place. But that which crowns the Work, is the Method of the Astronomers, which we must imitat in building this Aetherial, or Aereal Castle, call it as you please.

The first thing then to be done is, to part Medicine and Philosophy, which is but just; for they have been too long Brethren in Iniquity. Therefore all ye who mind to excel in this Art, shun Philosophy as ye would do the Pox, and study Mathematicks if ever ye design to arrive at Perfection. For *nunquam excoletur pro dignitate*

nitate Medicina quamdiu intra limites rationalis illius coercetur, &c. ipse dixit And lest you call in question his Authority, let us hear his powerful and weighty Reasons for this Divorce.

“ When Men first began (says our Orator) to follow the study of Medicine
 “ and Philosophy, for the good of the
 “ Body, or benefit of the Mind, never the-
 “ less the occasions for Medicine were ve-
 “ ry frequent, but for Philosophy only
 “ casual. For our Predecessors of old fed
 “ on Corn and Catle, and led a poor
 “ mean Life, exposed to all the inconve-
 “ niences of the Weather, and felt the hurt
 “ of Heat and Cold, that is, they fell sick
 “ before they thought of providing them-
 “ selves with Cloaths or Houses. Those
 “ were the first beginnings of Diseases, and
 “ these the first Remedies. But their Ca-
 “ tle also being of a short Life, and sub-
 “ ject to Diseases then, as well as now,
 “ brought them under a necessity of fol-
 “ lowing Medicine, and these that Cured
 “ them were said to help or assist Men.
 “ For he that keeps one from starving
 “ seems

“ seems to save his Life. But Men began
 “ to study Philosophy, after they had
 “ found out by Experience the Virtues
 “ of Remedies, and might safely, and at
 “ their own leisure, examine the Facul-
 “ ties of things.

Is not this a very learned Discourse to prove that Medicine is older than Philosophy, because the occasions for the one were more frequent than the other? When Men first began to Hear and See, the occasions of Seeing were more frequent: For turn your Eyes what way you please, some Object always presents it self: But the occasions of Hearing were less frequent and casual; for you may turn your Ear twenty way and hear nothing at all: Therefore Seeing is older than Hearing. I grant Necessity is the Mother of Arts, and that which is most necessary probably was before that which is less so. But, if I be not mistaken, Mens Minds were sick before their Bodies, and consequently had sooner need of Physick. But tho' this do not hold, there is another Argument beyond exception, which is, That Man was
 crea-

created a reasonable Creature, to whom it was as natural to contemplate the Works of his Maker, and to search after, and inquire into the Causes of Things, as to Eat, Drink or Sleep, and perhaps a little more: And I think what is Natural takes place of that which is Adventitious, as Medicine may be called. For though Man had stood in his Integrity, he had notwithstanding of that been a Philosopher: But I doubt there would have been place for Physick. Moreover, it is downright false, that ever occasions for Medicine were so frequent as these for Philosophy, which being nothing but *Natura rerum contemplatio*, as *Celsus* calls it, finds Objects every where: Whereas Physick is confin'd to the Body of Man, and only so far concerned with other things, as they have any relation to that: And therefore if the Doctor's Reason hold, Philosophy must be the elder of the Two.

But what though I should grant that Medicine is older than Philosophy, and once subsisted without it, it will not follow that it was better so than with it. For
this

this Art was a long time lame and defective, consisting of a few Experiments, and ill made Observations; until the time of the Divine *Hippocrates*, who first digested and set in order these things that before were confused, and lixed this rude Lump into a Form; and he it was that first institute the *Medicina rationalis*, joining Reason to Experience: And so brought Philosophy in into this Art, in which it is so necessary, that it can no more be without it, than a Ship without a Rudder. What can be more necessary for a Physician than Philosophy? Not the Jargon of the Schools, or that which evaporats into vain Curiosity, and contents it self with bare Speculation: But that which *Hippocrat* and *Galen*, and the other ancient Hero's of Medicine followed, which was to consider things not in their absolute Natures, but in reference to the Body of Man: But

Omne tulit punctum qui miscuit utile dulci
Hippocrat: de Vet: Medi: speaks thus. Atqui
milhi necessarium esse videtur ut omnis Medi-
cus de Natura sciat, & omni studio annitatur

ut cognoscat, si modo aliquid eorum quæ fieri debent recte præstare velit; quid est homo ad ea quæ comeduntur & bibuntur comparatus.

And Galen, *de simpl: medicam: facult: tells* tis, That we are not to consider, *Quale ex se sit medicamentum, neq; ad totam Naturam.*

And this is the Philosophy we must follow, and he that does not is justly esteem'd a Quack and Mountebank. And there is no more reason to reject Philosophy in Medicine, because the Philosophers are divided into a great many Sects, than there is for abandoning Christianity, and turning Atheists, Deists, Epicureans and meer Scepticks in Religion, because the Christians are divided into Sects, not a few.

But the Professor may alledge, that he is not against Philosophy in Medicine, but only maintains that it should be free from all the Sects of the Philosophers. Why what Evil have they done? *Quid meruere boves?* What hurt does Medicine sustain, whether the Physician be Peripaterick or Cartesian? Whether he hold a *Vacuum*, or maintain a *Plenitude*, whether Medicines work by their *Ocult qualities*

titles, or by the *Form* and *Figure* of their
 Parts, whether *Opium* makes a Man sleep
quia habet virtutem dormitivam, according
 to *Thomas Diaphorus*, or by its *rarifying*
Quality, according to the Doctor, &c.
 Does any Man of Sense take Indications
 from these Whimsies? Do these any way
 change the *Methodus Medendi*? Did not
 those who knew not the Circulation of
 the Blood use Phlebotomy in Fevers, and
 in different parts too, as well as these that
 know it do? I know no harm any can
 sustain by these innocent Speculations,
 except some crackt brain'd Fools, and
 these are not fit to be Physicians. A few
 Hours may be better spent this way, and
 with less hazard both to Physician and
 Patient, than in Drinking, or lying and
 Swearing, bantering the Scripture, and ri-
 diculing Religion.

But there is something more than the
 Philosophy I have mentioned, to make
 a Man a good Physician, that is an Ho-
 nest, Sober and Temperat Physician, which
 is, Moral Philosophy (or rather Christian
 Morality) which is so necessary to the
 Pro-

Professors of that Art, that none but a Mad-man, who is weary of his Life, will intrust himself to any other. This made the Great *Hippocrat* to fall out into this hyperbolick Expression. *Medicus Philosophus est Deo æqualis. Habent enim quæcunq; habent ad coercendam intemperantiam, inscitiam, avaritiam, concupiscentiam, rapinamq; ac impudentiam.* But it is superfluous to adduce an Authority to confirm a Truth that every Body knows: For how shall he that Fears not GOD regard the Life of Man? or he that destroys his own Health with Surfeiting and Drunkenness, prescribe good Rules for the Health of another? For *qui sibi nequam cui bonus alio*

But since the Doctor had not so much as a probable Argument for this Opinion, I'll furnish him with a Demonstration that will convince the World of the Truth of the thing in debate: For which he owes a Cock to *Æsculapius*, and a Capon to me, which I think the large better of the two, though at best it is but a lame Sacrifice. And that the Argument may go the better down, I'll dress it with a Geo-

metrical Sauce: But I must first beg two *Postulata's*, which I am sure none will refuse me, but either an Infidel or a Fool: *viz.* That Beasts were created before Men, and that none but a reasonable Creature can be a Philosopher.

Demonstration.

Beasts were created before Men (*per Postul. 1.*) and felt the Inconveniencies of Heat and Cold (*ut per se notum*) i. e. (according to the Doctor) they were first Sick. Now Necessity is the Mother of Arts (*ut per se notum*) and therefore the sick Beasts sought out Remedies, and no doubt found many, and consequently were both the first Physicians and first Patients, Man not yet being created. Now Beasts are unreasonable Creatures (*ut per se notum*) and no unreasonable Creature can be a Philosopher (*per Post. 2.*) *Ergo per Post. 1.* Medicine is older than Philosophy, *quod erat demonstrandum.*

Scholium.

This is so manifest a Truth, that it stands in need of no Proof, but may pass for

for an Axiom. Does not Nature it self teach us, that all Creatures seek their own preservation, and shun these things that hurt them and tend to their destruction? Hence it is that new-born Babes, who have not the exercise of Reason, seek after Food and Warmth, and shun Hunger and Cold as much as in them lyes; which their Crys, that are nothing but the voice of Nature, sufficiently testify. But why should I mention these, since the very Beasts themselves bear witness to this Truth? Do not we see Chickens newly hatched run to their Food, the true Physick of a hungry Paunch, and shelter themselves from the Cold, under the warm Wings of their Dame? Why should I speak of Dogs, who by instinct find among the Grass a Remedy for their sick Stomacks? *Naturæ morborum Medicatrices* saith the Great *Hippocrates*. *Nascimur Medici, sumus Philosophi.*

Thus it being proven, that Philosophy is not so ancient as Medicine, the next thing the Doctor demonstrats is, That Reasonings in Physick and Astronomy,

should both stand upon the same Foundation; which in the next Paragraph he proves thus.

“But because (says he Parag: 5.) we
 “understand that the most ancient Phy-
 “sicians alledged that Diseases came from
 “the Anger of the gods, and that Astro-
 “nomy was the first Science that was stu-
 “died by the most ancient Philosophers,
 “and that at the same time the Stars
 “were called by the Names of the gods,
 “it is very probable that these ancient
 “Physicians treated of such Diseases that
 “for the most part follow the Seasons.
 “Whence it follows, that according to
 “the Opinion of the most ancient Phy-
 “sicians and Philosophers Reasonings, in
 “Physick and Astronomy, should both
 “be founded on the same Principles. The
 Argument runs thus.

The most ancient Physicians were of
 opinion, That Diseases came from the
 Anger of the gods, and Astronomy was
 first cultivated by the most ancient Philoso-
 phers, and at the same time the Stars were
 called by the Names of the gods. Ergo
 These

These ancient Physicians in the beginning treated of these Diseases, that follow upon the change of the Weather. This is the First Conclusion, and the Second is like unto it: And therefore Reasonings in Physick and Astronomy, &c. q. e. d.

Now although this Demonstration be in its self very clear, yet to fit it for vulgar Capacities, I will illustrate it by an Argument of the same kind, but a little more evident and easie to be understood, which runs thus.

The most ancient Apothecaries administered Clysters by a Bagg. And the most ancient *Irish* made their Horses draw the Plough by the Tail, and about the same time *Ireland* was called *Teague-land*, Ergo according to the Opinion of the most ancient Apothecaries and *Irish*, Husbandry and Pharmacy should proceed upon the same Grounds. But to make the thing a little more clear, I'll give you another of the same kind.

Tom Trueman gave *Hob* the Millar a Box on the Ear, and a Lobster catch'd a

Hare about the same time that *Julius Cæsar* was murder'd in the Senate. *Erg:* (N.B.)

The Man of the Moon drinks Claret,
Eats powder'd Beef, Turnep and Carret.

However ridiculous you may think these Arguments, they are every whit as conclusive as the Professor's, only with this difference, that these conclude nothing, while the Doctor's, by a Trick of *Leger-de-main*, prove the quite contrary of what he designs. For he tells us, that the old Physicians first treated of these Diseases that follow the change of the Seasons, because they believed that Diseases came from the Anger of the gods: Whereas this very Belief made them neglect those we properly call Diseases, looking upon them as altogether supernatural, and thinking there was no other way to remove them, but by appeasing their angry Dicties with Sacrifices and Prayers. And therefore we are told, that *Podalyrus* and *Machaon*, who followed *Agamemnon* to the *Trojan War*, did great Service to their fellow Soldiers, in

cur-

curing their Wounds, without meddling any further, for the very Reason just now mentioned, which I will give you in Celsus's words. *Padolyrius & Machaon bello Trojano ducem Agamemnonem secuti, non mediocrem opem commilitonibus suis attulerunt. Quos tamen Homerus non in pestilentia, neque in variis generibus morborum aliquid attulisse auxilii, sed vulneribus tantummodo ferro & medicamentis mederi solitos esse proposuit. Eodemq; authore disci potest morbos ad iram deorum immortalium relatos esse, & ab iisdem opem posci solitam.* So much for the First Conclusion. The Second is of the same Mettal, and is so far from the Truth, that the quite contrary follows from this very Opinion, that Medicine is older than Philosophy. Whence it's clear, that the Dr's. Argument cuts its own Throat, and is truly *Felo de se.*

Philosophy being now sent a packing, and the physical Causes at it's Heels, let us proceed to the Work, and pursue closely this Method of the Astronomers, in order to the establishing of certain Principles. " These (says our Orator, Parag.

"tho,) did not receive into their Art the
 "Opinions of Orators, nor made use of
 "Fables which might please the common
 "People, for explaining the Motion of
 "the Stars; but by a long train of Ob-
 "servations made in divers places, and
 "at sundry times, and by comparing to-
 "gether the *Phænomena* of the motions of
 "the Heavens, by a Method familiar to
 "themselves, and useful to all, did de-
 "fine these Powers, by which Bodies in
 "motion did move towards other Bodies,
 "either in motion or rest. And this is the
 Method by which we are to find out these
 Principles in Medicine, that are as certain
 as these things we know by our Senses,
 as the Doctor alledgeth Pag. 14. and a-
 bout which Menskilful in Mathematicks,
 and freest from Prejudices are agreed. *Par.*
 6. "And do we still doubt (says he)
 "that Medicine is to be brought to per-
 "fection the same way? For indeed all
 "bodies are of the same Nature, and e-
 "very one may be changed into any other
 "of what kind soever; and so all Bodies
 "whatsoever their bulk or size be, are

“subject to the common Events of Mo-
 “tions and Mutations. Whence it fol-
 “lows, that the Laws and Affections of
 “the Fluids and Canals in the Body of
 “Man, may be defined, when either we
 “shall have made more Observations,
 “or rightly compared these which are
 “made already. *Parag. II.*

Can any thing be better said? Is not
 our lot fallen in happy times, in which we
 shall see this Conjectural Art erected in-
 to a Science, and settled on such sure Prin-
 ciples, by which we may as certainly
 Cure Diseases and foretel their Events, as
 the Astronomers do the Eclipses of the
 Sun and Moon, the rising and setting of
 the Stars, &c. But since the most part of
 Physicians are ignorant of this Method, it
 were Charity in the Dr. to furnish us with
 Ephemerides's, by which we might make
 yearly Almanacks of Diseases and their
 Cures.

But before I come to the Examination
 of this learned Speech, I must tell you
 that the Doctor has destroyed the Certain-
 ty of these Principles in his Problem *de*

Inventoribus, &c. For there he tells us that *nothing that depends upon the faith of History*, as the Principles of Astronomy do, *can ever be so certain as these things we know by our Senses*; And here he tells us, that the Principles of Physick must, like those of the Astronomers, be as certain as the Objects of our Senses, *i. e.* They must be both as certain, and not as certain at the same time, which is a downright Contradiction. Whence you may observe, that these who contradict themselves, as well as Lyers, had need of a good Memory.

Now all this Jargon about such Principles, is a Tale of a Tub, a meer Romance of the Doctor's own making, the spawn of his own Imagination, and are only to be found there, where he had e'en best keep them, for few else will venture to harbour such dangerous Guests.

Nothing can be of more fatal consequence in the practice of Medicine, than this idle Notion and vain Conceit. For he that pretends to such Principles, may venture on any thing, and set up for Curing Diseases as certainly, as the Astronomers

mers can define the Motions of the Celestial Bodies, which none but a Mountebank or Quack-salver will ever pretend to. But since one of the characteristick Marks of these Principles is, That they must be such about which the Mathematicians do agree, why are they so cruel as not to agree, and give us a printed List of them, that we may not practise any more in the Dark, and suffer Men to die after the old fashion? But what shall we do in the mean time? Let us e'en be jogging on after the old manner, and do what is most Probable and Reasonable, till our Deliverance come: For he that will venture to do nothing in Medicine without a Demonstration, may chance to make both his Patiens and himself share with *Buridanus's* Ass, which coming to a place where two ways met, and having no Demonstration for taking the one before the other, stood still and dyed of Hunger. In which I think she was *Tropo Mathematico*, which is in plain *English* a Fool.

But should not the Physicians in imitation of the Astronomers, make Observations

vations at different times and divers places, and compare these together, and not take up Principles at random from the Opinions of Orators? This Orator has no reason to be afraid that Physicians will take their Principles from him. And whereas he says, They should make Observations, &c. What else have they been doing above these 2000 Years? not in imitation of the Astronomers, for Medicine seems to be older than Astronomy, (at least according to the Doctor) but of the Great *Hippocrates*, (whose Aphorisms are so many Conclusions drawn from a long tract of Observations) or rather of Nature it self; without so much as ever dreaming of imitating the Astronomers, more than the Man in the Moon. For wise Men always knew and know still, that Medicine is of a quite other Nature than Astronomy. For after they had made their Observations and compared them, they found that different places required frequently different Methods: and that one thing was expedient at *Rome*, another in *Egypt*, and a third in *France*.

And not only so, but that the Age, Constitution, Manner of Life, Sympathies, Antipathies, &c. was to be taken notice of. Hence it is that *Celsus* saith, *Quod vix ulla perpetua praecepta Medicinalis ars receperit.* And in another place, *Ergo vetustissimus Auctor Hippocrates dixit, mēderi oportere & communia & propria intuentem.* Hence also it is that Medicine is called by *Pliny*, *Ars Interpolaris.* But that in Astronomy it was far otherwise. For they found that their Observations agreed, and that the Celestial Bodies observed the same Laws in all places, that the Sun in an Year, the Moon in a Month, &c. finished their Course, and returned to the same place. Any Body that understands the very first Principles of Medicine, knows that it is an establish'd Maxime among Physicians, *Ajuvantibus & nocentibus optima petitur Indicatio;* which for ever debars it from the benefit of these Principles the Doctor pretends to find out by this Astronomical, or rather Lunatical Method. But to show you how absurd this Notion is, and how inconsistent the Doctor

is with himself; consider but a litle, that the great Design he proposes to himself is, to set up Medicine *ab omni Philosophorum secta liberam*, free from all Sects and Hypothesis whatsoever; and yet at the same time he will have us to imitate the Astronomers who are divided into Sects, and have different Systems: that is, we must follow them, by not following them at all, which I think is the safest way by farr. Is not this a hard Task-master, to require the same Tale of Bricks, and yet give us no Straw? This brings us under the *Ægyptian* Bondage, and puts us in a far worse condition than ever we were at *Rome*, according to the Doctor's Dream, which is no more to be regarded here, than in any other part of the *Oration*, which is one continued Mistake from the beginning to the end. What is the Matter? shall not the Physicians be allowed to frame to themselves different Hypotheses (if they please) for explaining the *Phænomena* of Diseases, as well as the Astronomers for explaining these of the Celestial Bodies? No, by no means: For
Me-

Medicine was free born, and lived a long time so, and will never thrive till it recover its ancient Liberty, and enjoy its native Prerogative, and have nothing to do with any Sect, Party or Faction whatsoever.

But if the Doctor will needs have us follow this Method, why has he not told us how far, whether at a distance or slowly, or fast and clost at the heels? Which latter if we do, we may chance to break our Necks, or fall into some Ditch or Bogg, as these who have *Ignis fatuus* or *Willawisps* for their Guide: Yea, into these very Inconveniencies he would have us to shun. Nothing can be of more dangerous consequence, than to set up a practical Art, and a speculative Science upon the same foot, For in this there can be no hazard in framing and following as many different Hypotheses as you please. What prejudice does the World sustain, I pray, whether the Sun be the Center about which the Planets dance (allowing even the dull Earth to be one of the Ring) as Maids about a May-pole? Or the

Earth the fixed Point about which these glorious Luminaries turn? In all this *nobis nec seritur, nec metitur*. But if Astronomy were such an Art as Physick is, all these Hypotheses which before were innocent, would have more fatal Consequences, than any I know in Medicine, and change the very Methods of Curing. Wherefore let us take a Ramble through the Heavens, and suppose for a litle, that these Celestial Creatures may be subject to Collicks, Gouts, Gravels, Epilepsies, and all that Troop of Diseases that flew out of *Pandora's* Box, as well as we; and that the Astronomers are their Physicians: Let us see then what will become of it? I suppose then the Moon, when she is eclipsed, is in a fainting Fit; for what *Eclipsis* is in the Greek, the same is *Diliquium* in Latine, and in English, *Fainting*. The Shepherd *Endymion* perceiving this, begun to be moved with Compassion towards his kind hearted Mistress, and will needs consult the most knowing Physicians in the Diseases of the Starrs; and who should he choose but *Ptolomy* and *Copernicus*, both Physicians

ficians in Ordinary to the Moon: He designed also to have *Tycho Brabe* the Dane present, but he had been drunk over Night and was taking a Nap: He carries them to see the Patient: Now let us hear the Consultation: *Copernicus* being the younger spoke first thus. By all the Signs and concurrent Symptoms it seems to be beyond doubt, that this Ladys Disease is nothing else but *deliquium animi*, proceeding from Vapours occasioned by the Earth, from which noxious Streams arise, because of the Sun's absence, by whose benign Influence all Creatures enjoy Life and Health Strength and Vigour; especially this worthy Lady, who can no more be without it, than we without Air. That this is the immediat Cause of the Disease seems to me certain. But this is not enough, but the procatartick Cause must be enquired into, from which, if I be not mistaken, the principall Indication, both for curing this Disease and preventing a Relapse, must be taken. We must find out then the Reason why the Moon falls so frequently into the shadow of the Earth, which causes

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these

the said fainting Fits, and see whether the
 Cause be Internal in the Moon herself, or
 External in the Sun or Earth. I am of O-
 pinion that it is not in the Sun, who being
 fixed in the Center, as a Sennel to his
 Post, can never do amiss so long as he
 holds his Station. And therefore if there
 be any broken Heads abroad, no body
 can blame him, who is as innocent as the
 Child unborn. For the Earth it is but a
 dull, senseless, unactive Mass, and tho
 be always a Rambling, yet it has neither
 so much Wit or Malice to put such a Trick
 on a fair Lady, her kind Neighbour. The
 Cause then must be Internal, and ly in the
 Lady her self, who has been a long time
 over Head and Ears in love with *Endymion*,
 as every Body knows, and for the most
 part she goes down every Night, to kiss
 the Shepherd, as he lyes asleep upon the
 tender Grass, and frequently missing the
 way, (for Love is blind) she falls into the
 shadow of the Earth. And this I judge
 to be the true Cause, which being found
 out, the Cure is easie. For love being
 nothing but a kind of Madness, I thin

nothing can be more proper than great Evacuations by Purging, Bleeding, &c. and putting her under a strict Regimen for *fine Cerere & Bachus friget Venus*. Then spake *Ptolomey* thus. You have spoke very well (said he) both as to the Disease and its immediate Cause, the knowledge of which is not sufficient, as you very well remarked: But, if I be not mistaken, you have miss'd the Procatartick Cause altogether, by reason of your wrong Hypothesis: Here it is that you and I differ in the Cause, and I am affraid we disagree also in the Cure. My Opinion is then, that neither the Moon nor the Earth is to blame. For the Lady Moon is not in Love, as you alledge, and what she did to *Endymion*, proceeded not from an amorous Wantoness (which I confess is a kind of Madnes) but from meer Generosity, or rather Charity, which is a Virtue, and can never lead any Body out of the way. For *Jupiter* having condemned him to a perpetual Sleep, because he had been a little too homely with *Juno*, she stole him away from him, and hid him in a Cave under a Mountain, and stept

down sometimes at Night to see how his Head lay, without any sinisterous design. And for the Earth, I maintain she is fixed to her Post, and her Ear nail'd to the Center, and cannot in the least budge thence, and therefore she cannot be the Cause. For your Hypothesis that makes the Earth turn round is false; for it is only the reeling and turning of your own Heads makes you imagine so, as these who have a *Vertigo*, imagine all things turn round. The Cause then must undoubtedly ly in the Sun, who is a precise kind of Gentleman, and will not step out of his Road to please any Body, but will needs make Visits both to the Head and Tail of the Dragon, (according to his old custom); by which means, his poor Sister, who cannot live without his presence one Moment, falls into fainting Fits, in some of which she may chance to die one time or another. And therefore, in my humble Opinion, the Sun ought to be soundly purged with *Hellebore*, and Blooded *ad animi deliquium*, according to the Method of the Ancients, for his Disease is certainly a

downright Madness: For who but a Madman would make any Body run the hazard of their Life for a meer Visit of Ceremony. And lest you may think it strange that I apply the Cure to the External Cause and not to the Patient, I have for a President the Great *Hippocrates*, who cured a great Pestilence by kindling great Fires, and thus correcting the Malignity of the Air. Beside, there is nothing more ordinary than to apply Sympathetick Powder to the Weapon that made the Wound. And this is my Opinion grounded on my Hypothesis, and to which you ought to submit, you being but a young Man, and I your Senior. That will I never do, said the other, for my Hypothesis, according to which I proceed in the Cure, is as good as yours, and large better. And so they ended without concluding any thing, though both great Mathematicians. Wherefore we see the Moon subject to these Fits to this Day. From all which you may understand how safe it is for Earthly Physicians to imitate these Heavily, or rather Lunatick ones: And in

such an Art as Medicine is to follow the Method of the Astronomers.

Now the Doctor having demonstrat the Excellency and Usefulness of this Method, crys out, *Etnos dubitamus*, &c. And do we doubt that Physick is not to be brought to perfection the same way? We must doubt till we have better Grounds to believe. "Are not all Bodies (says he) of "the same Nature, and may be changed in- "to one another, &c. as above. Well reason- ed, all Bodies can be changed into one a- nother, as Elephants into Oysters, Sun Moon and Stars into Dunghils, Watches into Woodcocks. Here is a strange Me- tamorphosis. Would it not be pretty to hear one cry, Who will buy a Goose? and when you come to buy it, you find it a Pigg, at least you may perswade the Sel- ler so, by this Reason, That every thing may be changed into another of what kind soever. But as universal as the Professor thinks this Transmutation to be, yet there are some things altogether incapable of this Change: As for Example, these that are crack't from their Cradle can never be made

made sound; for their Disease is *vitium organi* & *a privatione ad habitum non datur regressus*. I confess they may be Cured by a Miracle, as the Man was that was born blind: But these that believe no Miracles have no reason to expect that one will be wrought in their Favours.

But that you may not take this for a piece of Counter-banter, I'll show you that this Reasoning is every whit as ridiculous and absurd as I represent it. For though all Bodies may be said to be of the same Nature, in respect of their common Essence and Properties as Extension, Divisibility, Mobility, &c. yet it will not follow that they ever can be changed into one another, or come under the same Laws; except the Doctor mean, that for ought we know the thing implies no Contradiction, from which nothing at all can be concluded. The Laws of Nature are established by the Author of Nature: But how far their Limits extend we know not. Yet we have reason to believe that He has set them their Bounds that they cannot pass. For we find that every thing propo-

gates

gates after its kind, and some Transmutations are very hard: For we can hardly make a good Fire of Ice, though a certain Author affirms, That in *Island* it is become so dry with Age, that the Inhabitants make very good Fewel of it. But granting all this, how will it follow that the Laws and Affections of the Fluids and Canals in the Body of Man may be defined? Very well; for all Bodies being of the same Nature, and subject to the same common Laws of Motion, the Terrestrial as well as the Celestial, these we see not, as well as these we see. And the Astronomers, by a Method familiar to themselves, and useful to all, having found out and defined the Laws and Affections of the latter, whose Motions and Regularity is obvious to our Eyes. Therefore the Physicians by the like Method may find out the Laws and Affections of the Fluids in the Body of Man, whose Order, Figure or Motion, they cannot see, though inlightned with the Mathematicks, as we shall see when we come to examine the Professor's Demonstration of the Uniform-

formity of the Pores. The Argument is just such another as this, One that sees well may be a good Painter : *Ergo* One that is stone blind may be so too. If the Professor would be so kind as to assist us with Mathematical Spectacles to see the Animal Spirits, the Form, Figure and Contexture of their Parts, and all the small Filaments and Pores by which all the Secretions are made, we would thank him for the Favour, and then think of following these Star-gazers. But though he could make our Bodies as transparent as Crystal of the Rock, so that we could see with the naked Eye, all the order and harmony of the Microcosm, as well as we do the Motions of a Clock, we should by this means have a more curious and useless Speculation, but never a whit more useful or successful Practice; Physick would still be a Conjectural Art, and Physicians still Guessers, and Men dye after the old fashion, and Mathematicians be mistaken, and Fools speak Nonsense. If indeed the Professor would teach us how to take down the Machine and set it up again, to take out a
 -ol crack't

crack't Spring, and put in one that is found and whole; and when the Pendule runs too fast to add some weight to the Ballancey and make the Vibrations more regular and equal and slow; then there would be some hopes of seeing some Mens Clocks go better, and strike more regularly: Yet after all, I must confess, there would still be some Watches that all the World would never make go right.

The Professor has hitherto only shew'd us in general the Usefulness and Advantage of this New Method: But now he comes closs to the Point, and makes Application to a particular Case, to show us the Power of his infallible Principles, and the heroick Exploits of his new knight Errants, the Mathematical Causes: Than which nothing can be more just; for all the Proof of the Pudding is in the eating. But if ever the Doctor make a good Pudding with this Seasoning, I'll eat the P----

“Because (says he Parag. 25.) I said
 “that it was not necessary for Physicians
 “to search out Physical Causes, and that
 “this may seem a hard Saying to the Phi-
 lo-

Philosophers: Therefore I'll illustrate and confirm the whole Matter, by an Example that none can except against. This is the first time that ever I heard, that the knowledge of Physical or Natural Causes was altogether useless to a Physician. And therefore no wonder that not only Philosophers, but all pretenders to common Sense think this a faucey and senseless Saying. Are not all evident Causes natural ones? But if the Doctor understands the first Principles of natural Bodies, the springs of their Actions, and the way and manner of their workings; I know none but some light nodded Mountebanks that follow this *ignis fatuus*, or false Light, or pretend to take any practical Indications thence, no more than from Mathematical Causes. For, as I told you before, neither *Hippocrat* nor *Galen* thought any such knowledge necessary. But that this is not the Doctor's Meaning, I will shew you by and by; for he himself alledgeth the knowledge of such Causes, as the Physicians call Physical or Natural, very useful in the practice of Medicine. But let us hear him out.

“ The

but The Physicians (says he) that wrote before us of the Diseases of the Eyes, in which a kind of Images or Semblances appear before them, and trouble the Sight, confidently affirmed that the physical Cause of this was, some little Corpuscles or Motes swimming in the watry Humor of the Eye, which moving hither and thither up and down, imprint on the *Retina*, as it were the resemblance of Flies, or such like things, which we think we see before us. And in this the Doctor alledgeth they were very much mistaken.

Here is a sad and lamentable Story, that poor Mortals should have been so long haunted with those Spectres or Ghosts (for so our Orator calls them) which are of a quite different Nature from all others of that kind, which for the most part haunt Men most in the Night; but those are most troublesome in the Morning, especially after a rousing Cup. Is it not sad to think that no Body appeared for so long a time, that had skill enough to conjure these Spectres? But I see not what the Professor

fessor can say for himself, since he knew how to have sent them a packing with his Mathematical Rod, 8 or 9 Yeats ago. For you must know that the design of building this Castle in the Air, is not so late as one would imagine, the Materials has been a long time a preparing for it.

Tantæ molis erat Medicinam condere gentem.

For the Doctor had a learned Discourse on this Subject, out of which this is extracted, in the Year 1685, about which time it was prophesied that the Land would begin to Thrive. The Prophecy is this.

For who survives the Eighty-five,
Shall see the Land begin to thrive.

By which it appears that it was to thrive in Medicine, as well as other things. And this seems in some measure to illustrate the former Prophecy. Pray mark the Harmony.

In this Discourse the Doctor treats some eminent Physicians like School Boys, telling us, That they like Sheep followed
the

the Flock that went before them. These Beasts that followed the Herd were *Plautus*, *Senectus*, *Riverius*, &c. which were not such Dunces, nor blind Admirers of the Ancients, as our Orator would make them. But since those were the Sheep in Medicine, I wish the Doctor would tell us who were the Goats, that we might separate the one from the other. There is one Passage more in this Discourse that ought to be taken notice of, and may be of great use to those that love a Cup, *viz.* That these Ghosts haunt Folks most in the Morning after drinking of Wine, but (*N.B.*) especially Ale. Whence I observe, that if we must needs take our Collation, that it be rather in the pure Blood of the Grape, than in muddy Ale: For if that make some Hobgoblins appear, this will make you imagine you see whole Legions of Devils. A second Observation is, That these evil Spirits are always raised with Drunkenness: Whence it follows, that the way to lay them is to go sober to Bed. But let us go on. "I affirm (says the Doctor) that no Corpuscles swimming in the aqueous Humor;

" or contain'd within the Eye, can imprint
 " their Image on the *Retina*. And I affirm the
 contrary, and so we are quits. But it must
 not go so: " For (says he) whoever consi-
 " ders well how large the Diameters of the
 " Eye must be, and what are the Laws
 " of Refraction, will find, that the Image
 " of any thing within the Eye, which is
 " placed before the *Retina*, must be pro-
 " jected outwards, and can never make a-
 " ny impression on the *Retina*, and there-
 " fore can no ways affect the Sight. And
 I say, whoever considers the Laws of Sense
 and Reason will find this Passage stark
 Nonsense. As for his Laws of Refraction,
 since he has not told us what they are, I
 am not concerned in them: For a Law not
 promulgat is as good as no Law at all.
 But the Doctor out of an excess of Char-
 ity has dispensed with these Criminals be-
 ing tried by the Laws of the Dioptricks,
 and remitted them to the Judge Ordina-
 ry Experience, who is very impartial.
 " But (says he, in the above-mentioned
 " Discourse 1685.) the thing is so clear,
 " that without the help of the Opticks,

“ it may be demonstrate every Day by
 “ Experience: For if any thing be brought
 “ so near the Eye, that it almost touch the
 “ *Cornea*, the Eye will have no impression
 “ of it, nor any perception at all. Now
 though this be as false as *Transubstantiation*,
 and equally contradicts the Testimony of
 our Senses, yet many considerable Advan-
 tages result from it. The *First* is for those
 who have tender and weak Eyes, who
 cannot endure the Light; for they may
 keep their Eyes almost quite shut constant-
 ly (which will contribute very much to
 the Cure) and nevertheless see every whit
 as well as if they were wide open: For
 when any thing is brought so near the
Cornea that it almost touch it, as the Eye
 lids no doubt do, it will make no impres-
 sion upon the Eye at all, nor any ways
 obstruct the sight. The *Second* is for those
 who have a Cataract growing on the Eye,
 to convince them of a Mistake they all
 labour under, which is, that they see al-
 ways something like Midges or Flies that
 trouble the sight; to convince, I say, these
 poor deluded Creatures, that it is only a
 de-

deception of the Sense, and sickness of their Brain, and consequently that they must be treated as these who are Hypochondriack or Mad, without taking any notice of their Eyes at all. The *Third* and *Last* is universal and useful for all, which is, To make Men see through a Mil-stone, as well as the most transparent Crystal, by making the Object almost touch the *Cornea*: For then you will see every whit as well as if nothing were in your way at all. I hope no Man will doubt of these Conclusions, since you have the Professor's word to warrant them. *Ipse dixit.*

But all is not yet done, he has another String to his Bow; and I make no doubt with this two-fold Cord these poor Hobgoblins will be strangled. For he foreseeing that an Objection might be made, that although these little Corpusculs could not be said properly to make any impression on the sight; nevertheless they might produce the like effect, by hindring some Rays of Light that come from the Object to penetrat to the *Retina*, and so hide some parts of the Object from our sight, has

armed himself with an *Effatum*, which he never wants upon occasion. The *Effatum* is this, *That there is no point of any visible Object, from which there comes not Rays of Light to every point of the Cornea; so that although many points of the Cornea were covered with Spots, nevertheless all the parts of the Objects would be seen.* This *Effatum* may truly be called *Effatum*, which comes from *Fartum* a Pudding: For never was Pudding more stuffed with Meat, than this is with Nonsense. Do not we see Objects by the Rays of Light that comes from them to the *Retina*, and if there come none from them at all, they cannot be seen (except Men have Cats Eyes, who, they say, see in the Dark) and by the same Reason if there come no Rays from any assignable part or point of the Object to it, there can be no perception of that part at all. Now if there be any Spots on the *Cornea*, or in the aqueous Humor, and if the Rays coming from any part of the Object fall on them, they can never penetrat into the bottom of the Eye, and so can make no sensation of these Parts there, which con-

fe-

sequently must be hidden from our sight. Do not all opack Bodies cast a Shaddow? And are not these Spots such? By what Inchantment then have they been wheedled out of their Birth-right? I have found where the knack lyes, which is here, That these litle Bodies are Witches or Wizards, which Children say have no Shaddow: And with this Reason I am content, till the Doctor find a better.

You see it was not without a Cause that the Doctor was angry with the Old Physicians, and that he had just ground to disposess the physical Causes, and banish them from the Common-wealth of Medicine: But it was as just that some other should be put in their room, who will prove a great deal better Subjects than they: And these are the Mathematical Causes.

“ But (says he) if that Point of the *Retina*, or Net in which the Rays that come from any visible point of the Object, should meet, be covered or compressed, so that the Image cannot reach it, there will be no sensation of the Object at all.

“ And if the same thing fall out in many
 “ points of the *Retina*, all these things
 “ will come to pass that the Physicians
 “ believed for so long a time was trans-
 “ acted in the watry Humor. And be-
 + lieve so still for any thing the Doctor has
 said to the contrary. But he goes on. “ E-
 “ very Body knows that the *Retina* is a
 “ kind of Net, knit or woven of the Fi-
 “ laments of the optick Nerves. That’s true
 good Doctor, but no Body knew it was
 a Net to catch Flies, till you told them.
 “ This Flie-trap is invironed with the
 “ sanguiferous Vessels that creep along
 “ the bottom of the Eye, especially in
 “ that part where the entry to the optick
 “ Nerve is. Therefore if the Eye be so
 “ placed, that the Rays must needs fall
 “ upon that point of the *Retina*, there
 “ will be no representation of the Object.
 “ This will easily be found to be true, if
 “ two Objects be exposed to our view in
 “ the same Line paralel to the Horizon,
 “ a litle higher than the Eye, and about
 “ a Foot and a half distant from one ano-
 “ ther: Then shutting the left Eye, and
 “ di-

" directing the right towards the Object
 " on the left Hand, as the nature of the
 " Eye requires: First we shall see both
 " Objects distinctly; then coming to such
 " a point, the Object on the right Hand
 " will evanish, while in the mean time
 " we see all round distinctly.

Here one would almost swear, that the
 Professor was playing at Cross-purposes
 with this long winded Story of the Net
 in the bottom of the Eye, with which he
 designed to catch his Adversaries the Old
 Physicians, as Spiders catch Flies; but
 these Foxes are too cunning for him, and
 in stead of catching them he has spread
 a Net for his own Feet. For the Doctor
 proposes a question that no Physician
 hitherto could Answer; and no wonder,
 since they were ignorant of this new Me-
 thod, and never dreamed of Mathemati-
 cal Causes. The Question is, What is
 the Cause, of a kind of litle Images of dif-
 ferent Colours, but for the most part black
 that appear before some Folks Eyes like
 Flies or Midges? The Old Physicians
 Answer, that it is Motes that sweem in the

aqueous Humor of the Eye that makes this Impression and Appearance. But the Professor rejects this, and nauseates it as musty with Age : The Reason then, says he, of the appearing of these Images is, because no Image at all appears. “ For “ the Rays of Light (says he) falling on “ these Points of the *Retina*, where the “ the Filaments of the optick Nerves are “ covered with the sanguiferous Vessels, “ there will be no Image of the Object “ at all. And to convince you the more of the truth of this, he illustrates the Matter wonderfully by a very apposite Similitude, of two Objects placed as abovementioned, whereof one disappears at such a distance. For the Question being, What is the Reason we come to see Objects we saw not before, which trouble our sight ? It is Answered by this Similitude, because we loose the sight of these we saw before. Is not this well answered ? Can any thing be more just, than he that looses at one hand, should gain at another ? Thus many hard Questions may be answered, that are both curious and use-

useful : As wherefore hath a Horse four Feet ? Because a Man hath two. Wherefore do you see the Steeple of *Edinburgh* ? Because you see not the Castle of *Dumbarton*. Why do you scratch your Head ? Because I do not scratch my Breech. But there is another part of the Question that remains still to be answered by this Similitude, *viz.* What is the Reason, that where ever we go these Spectres haunt us, and we see them distinctly ? It is Answered, because in the paralel Case an Object we saw before disappears at a certain distance, but stepping either forewards or backwards it presently appears again.

Here is one of the most excellent Discoveries that ever the World was blessed with, for curing Suffusions, Pearls on the Eye, and Obstructions of the optick Nerves that are not total : By which the Doctor may become more famous for Curing the Diseases of the Eyes, than ever *Sancta Lucia* was. For that which was done formerly by the old dogged Method of Purging, Bleeding, Cupping, Blistering, &c. is now performed in the twink-

twinkling of an Eye; for advance, or retire, to the right hand about, or to the left, change the posture of your Eye but a hair breadth, and by the virtue of *Hocus pocus, presto be gone*, the work is done.

In the Conclusion the Doctor tells us, that though the Physicians hitherto have been ignorant of the physical Causes of these Diseases; yet he thinks that he has explained their *Mathematical* or *Medical* Causes, *the knowledge whereof is very useful and profitable for Physicians.*

Who can doubt of the truth of this, after the Doctor has given so pregnant a Proof of this in the above-mentioned Case: Wherefore I exhort all Physicians who are ignorant of the Mathematicks, to betake themselves seriously to that study whatever their Age or Experience be (for it is never too late to learn) if ever they design to Cure Diseases *Cito, tuto & jucunde*, which they can never pretend to without the knowledge of their Mathematical Causes. *Which was the thing to be demonstrat.*

Now the Doctor having done his work, closes all with an *Utinam*, as with a Grace
after

after Meat, (which was very well minded, for he forgot to say one before it) "I wish, says he, that I could as easily and clearly explain all the Diseases of the Body of Man and their Cures, as I have done this.

And I wish I could as easily refute all Errors, as I have demonstrat this Oration to be stark Nonsense, and down-right Gibberish. And thus I have done with the *Inaugural Oration*, which is the ground work of all.

I proceed next to examine the Doctor's *Dissertations* or *Discourses*, and to take a view of the statly and magnificent Fabrick he has reared upon this Foundation. Here you shall have the Solution of many great and weighty Problems (not Triffles or matters of Moon-shine) in which Mankind is as highly concerned, as to know whether *Balaam's Ass* had a short Tail or a long, or in what Language she reproved her Master. But such as they are noBody hitherto could solve them; because, says the Doctor, they begged a great many things that were doubtful, obscure and uncertain;

rain; (which I think none but a Knave would ask, and none but a Fool grant) whereas by Principles plain and easie to be understood, the Matter may be exped. This plain and easie Geometrical Method the Doctor follows all along in imitation of his great Master *Archimedes*, who beg'd but as much Ground as to set his Foot on, and he would remove the whole Earth, and toss it like a Tennis-ball up and down the Air. This was but a poor Demand, yet poor as it was no Body would give him his asking, being affraid the Experiment might cost them too dear; for though their persons might be secure, no Body could be found that would ensure their Glasses and China Dishes. But in this I think they were a little too peevish and nice. Had I been in those Days and had had but one Foot of Ground bordering upon the terrestrial Glob, he should have had it at a very easie Rate: And I should have been as litle affraid of his performing his Undertaking, as I am of the Doctor's performing his, though I resolve to grant him all his asking, although it were tentimes more.

The

The First Discourse that presents it self is that *De motu sanguinis per vasa minima*. In this the Doctor designs to be as good as his Word. For in his *Oration*, as I told you before, he says, He thinks he "can demonstrat, that there are no Ferments in the Glandules of Man's Body, and that all the Pores and Orifices of the Vessels have one and the same kind of Figure. We shall see by and by whether or no his Thought has beguiled him for once.

The principal Design and Scope of this Discourse, is to explain how Secretion is transacted in the Body of Man. You know that a great many Fluids are separat from the Mass of the Blood, as the Liquor of the Nerves, the Lymph, the Bile, the Urine, &c. Now here the Doctors differ, some maintaining the Doctrine of Ferments, others who pretend to a more subtle and refined Philosophy, imbrace the mecanick Hypothesis, which explains all Secretion by the different Figures of the Pores and Particles of the Fluids: Some join both together. The Doctor undertakes

takes to demonstrat the Absurdity of these, and to prove that all the Pores are alike in Figure, and differ only in size, and by this Hypothesis pretends to explain Secretion.

Here the Doctor has to do with Men of his own mettall *Des Cartes* and his Followers, Mathematicians all over; and no doubt there will be a sound blow: For no War is so cruel as that amongst Brethren. Who can withhold crying to see

----- *Infestisq; obvia signis,*

Signa pares aquilas & pila minantia pilis.

For my part I am little concerned, I shall only look on and see fair play.

The Mechanists to illustrate their Opinion, adduce the Example of a Sieve, having holes of different Figures, as Triangular, Circular, Square, &c. through which they alledge that Bodies of the same Figure and Size will pass, while others of a different Figure cannot though no bigger than the former.

The Doctor on the contrary alledgeth that the similitude is altogether impertinent;

nent, because it is not (according to him)
 difference of figure, but of bulk that makes
 one thing pass and another not. Therefore
 sayes he *Sect. 9.* " All bodies that pass
 " throw a sieve, must be less, whatever
 " their figure be, then those that do not
 " pass: that is (as he explains himself)
 " they must have less Diameters. For if
 " all the Diameters of those that pass, not,
 " be no greater then the Diameters of
 " those that do pass, then of necessity
 " they must pass mixed together. From
 " whence it follows that diversity of figure
 " in the pores and particles of fluids, is not
 " sufficient except we suppose likewise dif-
 " ference of bulk, which alone without
 " this superfluous diversity of figure will
 " do the job.

To which the Mechanists answer that
 nothing is more absurd than to assert that
 it is only difference of bulk and not of fi-
 gure by which secretion can be explain'd,
 and that things of the same bigness though
 of different shapes will necessarily pass mix-
 ed together. For every body knows that
 two skrew nails every way alike in bulk, the
 Diameters

Diameters of the one no manner of way bigger then the other, only because of some small difference in the figure. *Viz*, when the spiral line of the one runs cross or contrary to that of the other. I say every body knows, that the one of those will enter where the other cannot. Yea which is more some bodies can be assigned whose bulk and Diameters are every way less, then that of others, and yet these less will not pass where the greater do, (but I have told the Doctor too much at once for any thanks I am like to have for it) which downright destroys the Doctors opinion, who it seems has not consulted his Analyticks well in this, to suffer himself to be skrewd out of it, by a poor vice-nail. That which beguiled the Professor is (and he owes me thanks for the discovery) that the thing holds in some figures, though not in all: But it is dangerous from a few particulars to infer an universal conclusion. What can be more unjust then to alledge that all men are Rogues, Cheats, or Fools, because some are such? Or to judge all Physicians Atheists, because

cause some Miscreants of that Profession has been such fools, as to value themselves for that very thing (thinking nothing could prove them men but denying God) I say Fools or Mad-men; because it is only the Fool that hath said in his heart that there is not a God, and none but a madman will express it with his mouth: which is a demonstration to me that all Atheists are such.

What a shame is it for a Professor who teaches others, to make such a wrong step, as to conclude that because difference of bulk is sometimes the cause of such a thing, therefore it is alwayes so?

Turpe est Doctori cum culpa redarguit ipsum.

He should have considered that it is in the oeconomy of the little world, as it is in that of the great. For as in this, there are some men civil and courteous: others rude and unmanuerly; surly and dogged, snarling and currish; so in that, there are some pores and particles whose figure is smooth equal and plain: and others whose surfaces are rough and unequal: these may

be called surly curst or snarling pores, those civil and well behaved ones. Now suppose a pore to be smooth, and a cube or (some say) a sphere comes to its door, they may enter freely, pass and repass without trouble or molestation, providing their Diameters be no greater then those of the pore. There is nothing but civility here. But if a cross-grain'd cylinder, such as my skrew nail, comes to a pore whose spiral line runs cross to its, it may well knock at the door, but not enter: then they must needs fall a scolding. What sayes the nail, why may not I pass as well as that fellow that entered just now, who can pretend to no better rank or quality then me who am in every Diameter alike? You he sayes the pore he is a civil gentleman, and passes discreetly, and you are cross-grain'd and surly, quite contrary to my humor, get you gone, or I'll send you a packing with a vengeance. And from this cause I imagine proceed the sharp conflicts between *Acids* and *Alkalies*, Viz. from a ramcounter between dogged, ill natur'd pores, and surly snarling fluids who

when

when they have graped a while, till they are almost quite out of breath, at last make a peace : for *Pax quæritur bello.*

But this is not all the Doctor has to say, for granting all the orifices of the vessells had such determinat figures as Triangles, Squares, Paralelograms &c. fitted for receiving Cones, Cubes and Prisms, and all other kindes of particles, that are to be separat from the mass of the blood in the glandules, granting this (as he alledgeth) no secretion will follow upon it. For that this way may be effectuat, it is necessary not only that those particles be equal to, and of a like figure with the orifices, but that they be scituat the same way, when they come to enter. As for example, that a cubick partiele of salt, or any other thing, may enter into a square Pore, it is not only necessary that the one be equal to the other, but that it be scituat the same way, i. e. that the Angles and Sides of the cube answer exactly to those of the Orifice; for this is the only way it can enter. The same holds in cones &c. But there are infinit other ways these particles

may be scituated at their approaching the Orifices, which will hinder their entry. From all which the Doctor concludes, that no secretion can be made this way, because there is but one cause can be assigned for it, and infinit causes that may hinder it. And this is the pith and Marrow of the Doctors objection, though not in the same words as it is proposed by him.

Now here is a great deal ado, which amounts to no more but *a may be*, and, as we use to say, what may be may not be. The Doctor cannot deny that the thing is possible, which is enough to blunt the edge of his pretended demonstration: for what is demonstrat is so certain that the contrary is impossible. Nothing can be more ridiculous than to reason thus. For though there be but one way such a thing can be done, and ten thousand wayes to hinder it: yet if the thing be determined to act that one way, the ten thousand possible impediments amount just to nothing at all. If the Doctor be so generous as to grant his Adversaries that the particles have certain determinat figures, why will he deny them

them certain determinat motions and scitu-
 ations. And when he assigns me a cause,
 why such a Pore or particle is Triangu-
 lar, Square, &c. then I'll tell him what
 determines the scituation of these li-
 tle solids such a particular way,
 when they approach the Orifices of the
 secretory vessels. There is but one way
 I know of for a Rope-dancer to keep himself
 from falling, and that is by ballancing his
 body and keeping it in an equilibre, and
 a great many wayes he may fall, and yet
 for the most part he does not fall: when
 a Cat is thrown from a height, for the
 most part she falls on her feet, though
 there are many other wayes, she may fall.
 Now let us suppose these Cubes, Cones,
 &c. to be as dextrous at entring the Pores,
 as the Rope-dancer is to ballance himself,
 or the Cat to fall on her feet, and the work
 is done. I may suppose also that these
 litle bodies are of a stiff and stubborn, self-
 conceited nature (as for the most part litle
 folks are) and will enter no way but one,
 just as the loadstone will draw nothing
 but iron, though you should present a

thousand other things, and the needle touch'd by it will turn but one way, tho there be almost infinit otherwayes it may turn. You see Sir the Doctor has demonstrat Mathematically, that secretion cannot be performed this way, which since it is daily done in the body of man, it must certainly be performed some other way. And here we come to the pretended demonstration of the uniformity of figure in all the Pores, which the Doctor concludes to be round: and by this plain easie way he pretends to explain secretion.

“ A circle sayes he, *Sect. 14.* is the
 “ largest, and most capacious of all fi-
 “ gures that have the same Diameter with
 “ it self, and will admit the plains of all fi-
 “ gures whatever way they be scituat,
 “ providing their Diameters be no greater
 “ then its own: Therefore since it is in-
 “ finitly more probable, that bodies com-
 “ ing to any Orifice that is not circular,
 “ will not answer exactly to it, it is high-
 “ ly probable also that by forcing their
 “ entry, they will change the figure of the
 “ Orifice into such as will give free pas-
 sage

“ sage to bodies of any figure; or scituar
 “ any way, *i. e.* they will make it cir-
 “ cular. Which will yet more certainly
 “ come to pass, if that which runs into
 “ the Orifice be liquid: for in that case,
 “ though the Orifice were not circular,
 “ nevertheless, seing the parts nearest the
 “ centre, *i. e.* the Sides, are more pressed
 “ and thrust outwards by the liquor, than
 “ the parts that are farther from the cen-
 “ ter, *i. e.* the Angles, and since the Sides
 “ of the Orifice are flexible and easily
 “ yeeld, it follows that all the parts of
 “ the Orifice will necessarily be thrust out
 “ to the same distance from the centre,
 “ *i. e.* the Orifice will at last become circu-
 “ lar. *q. e. d.* Here is a long and perplexed
 demonstration with four times, *id est*, to
 which I ad a fift to make it a dose, *i. e.*
 it is all down right non-sense. Here is the
 demonstration long lookt for, which

Expectata diu tandem venit.

And lands all in infinitely more probable,
 and very likely *i. e.* a probable demon-
 stration, *i. e.* no demonstration at all, But

such as it is, let us consider it till we get a better.

It's highly probable sayes he that the Pores, though they were not circular will at last become such, by the little corpuscles of different figures, striving to enter and forcing their way. To which I answer that there is not the least shadow of probability for it, yea it is altogether improbable, and quite contrary to the Laws of Nature, and the æconomie of the little world. For suppose a cube striving to enter a square Orifice, should apply its corners to the sides of the square, providing they be equally hard, they may well play at hard heads a while together; but in my humble opinion the cube would come off with the loss of his bolspreet, and if he continue to play tricks still, may not only chance to level his nose with his cheeks, but also to smoothe all his angles, and make himself round in stead of the Pore, and by this means take a Tartar: for every School Boy knows that the angle of any thing is sooner broke of than the side.

But

But the Doctor may urge, that if one single Cub were engaged with a single Pore, it would fall out as I suppose: but he is back'd with a great Troop of confederat Cubs, Cilynders and Prisms, which like a Torrent come on rap rap on the Orifice, and at last by forcing their way, reduce the irregular Orifice to order, by making him smooth and round. Now tho' I should grant that they might thus force their way, yet it will not follow that ever they can make the Pore circular (for it is capable of almost an infinite number of other Figures) except they be supposed to combine together, and fight under the Banner of the *Archæus*. But though this were true there is one thing remains, that quite mairs this Design, which is, That the Pores get always fresh Recruits from the Blood & Spirits, which makes them able to stand their Ground, and maintain their Post against the Assaults of these Bravado's. What the Doctor subjoins is altogether as impertinent as the former, viz. That this will more certainly come to pass if that which runs into the Orifice be liquid,

Ec.

See for it is contrary to the Laws of the
Oeconomie of the Body of Man. Do not
 we see those Parts which are most pressed,
 best nourished: And hence it is that they
 that use Hands and Feet most, have them
 bigger and stronger than others. And
 therefore if we should suppose with the
 Doctor, that the parts nearest the Center
 are more press'd than these further off, it
 will not follow, that the Pores will change
 their Figure, no more than that a Man's
 Mouth will grow round if he eat many
 Plums. How comes it pass that the *val-
 vule Sigmoides* and *Mitrates* are not quite
 worn before this time, by the motion of
 the Blood? And whence is it that the
 Nostrils maintain their irregular Figure so
 many Years against the liquid Air, that
 Day and Night runs through them, and
 are not become circular long ere now?
 Or that the *Uvula*, which stands out like
 a promontory, is not wash'd away by the
 Waves of the same Element that tols con-
 tinually against it? as important as the
 Now this Paralogism, or rather Deli-
 ration, is not only believed by the Doctor
 and

and his Admirers to be a Mathematical Demonstration, but (as he says himself) is approved for such, by two of the most famous Mathematicians in *Europe*. From which I observe, that most famous Mathematicians may fall into foul Mistakes; and that implicate Faith is as necessary in the School of *Archimedes*, as in the Church of *Rome*. For to believe a Dream to be a Demonstration in contradiction to our Reason, and Bread to be Flesh, contrary to our Senses, is equally absurd.

But that I may not seem to deal a little too severely with the Doctor (for *summum jus, summa injuria*) in refusing Demonstrative Evidence, and casting Mathematical Certainty, I'll grant him for once, that all the Pores of the Body, and Orifices of the Vessels are round of necessity, and by the very Laws of Nature, and that this Dream is as good a Demonstration as any in *Euclid*. Let us see then how Secretion will be performed this way.

The only Secretion that I think will follow, is a kind of Secretion, which may be called no Secretion at all, or more properly

perly Confusion. For either the Pores by which the Bile is separat are narrower, or wider, or of the same bigness with those through which the Urine is separat in the Reins. If the *First*, then the Bile would flow in greater abundance into the Reins than into the litle Bladder that contains the Gall, because of the wideness of the passage. If the *Second*, then the Urine would go in greater quantity into the *Receptacle* of the Bile, than into the Reins, and thence into the Intestins; which I think would be very convenient, and save the Expence of many a Clyster: For Fowles who have their Ureters inserted in the *intestinum rectum*, let both fly together. If the *Third*, why then should they go into different Receptacles, and not pass equally both ways? except we suppose that *Dolæus* Bogles stand Sentinels at the Orifices; and suffer none to enter but these that have the *Archæus* Pass, to go into such or such a quarter. The Matter, as I conceive, may be clearly explained thus, according to the Doctor's Hypothesis, which supposeth all the Pores round, and only different in size.

The

The Body of Man, you know, is called the *Microcosm* or little World; in which there must be a Government, as well as in the great World. One of the fundamental Laws of all Government is *Property*, without which all must run into Confusion and Disorder. There must be likewise some Supreme to see the Laws put in execution, and every Man's Right maintained. Now in the *Oeconomie* of Man's Body every ones Right is settled by Law. The Blood, the Bile, the Animal Spirits, the Urine, &c. have all their own Territories assigned them: The Head for one, the Veins and Arteries for another, the Reins for a third, and so on. While these live peaceably together under the Government of the *Archæus*, all is well, the Body is in good Health. For as the thicker cannot pass where the thinner may, so the thinner dare not pass where the thicker does, without being punished by Law. Now if notwithstanding all this, they come to invade one anothers Properties, and the Blood go by the way of the Urine, and the Chyle by Stool, and the Bile by Vom-
 mit,

mit, then an Intestine War is raised in the *Microcosm*; which if the *Archæus* can compesce, all is in peace again: And if not, the *Oeconomie* must go to ruine, and resolve into the state of Nature: where, they say, all things are all Mens, *i.e.* Nothing is is any Mans. And this is the only way that Secretion by Pores of the same figure only differing in bigness, can be explained without Confusion: And so once more I have helped the Professor out of the Mire.

The Doctor now having got the Victory (not without my Help) claps his Wings and crows, extols his Geometrical Method to the Skies, telling us *Sect. 17.* That he cannot but rejoice in behalf of Medicine and this happy Age, in which Geometry is brought to such perfection by many skilful Artists, especially by *Isaac Newton*, that there is ground to hope, that by the help of Principles which that great Man has found out, the Virtues and Qualities of Medicaments, which are for the Comfort and Succour of Mankind, will be more certainly discovered.

Now as the Doctor cannot but rejoice,
 so I cannot but be sorry and pity some
 Men in this Age, who are given up to be-
 lieve Lies, and publish to the World
 Dreams for Demonstrations. And if this
 were all, it were no great matter; for it
 is but natural for Men to be fond of their
 own Imaginations, though never so ugly.
 But to see some who pretend to common
 Sense, and an ordinary stock of Learning,
 fall down before those Idols, or Nothings
 (for an Idol is nothing) and worship not
 the Works of their own Hands, but the
 Spawn and deformed Brood of other Mens
 Brains, is such a piece of Absurdity that can
 hardly be matched, and such a degree of
 Madness that nothing can excuse but in-
 vincible Ignorance, or *vitium organi*. What
 this great Man may do by his Principles
 for the advancement of Medicine, I know
 not: But if what the Doctor has given us
 be a foretaste of the Fruits we are to ex-
 pect, we have reason to look for nothing
 but sower Grapes that will set our Teeth
 on edge, and give us the Gripes to boot.

These

These are but *Rodomontado* Expressions that arise from ill digested Thoughts, as Belching does from the Crudity of a weak Stomack. Men may brag what they please, and tell us of their Dreams and Visions, and their new Methods of perfecting Medicine: But I maintain there is no other Method but that of the Ancients, especially of *Hippocrat*, by which we can advance that Art, and no wonder since it is the Method of Nature. And for finding out the Virtues and Qualities of Medicines, we must learn that from the Schoolmaster of Fools, and his two Ushers *Analogie* and our *Senses*. For the Mathematicks can no more assist us here, than the Lunaticks. But this may seem a little too bold, since the Professor has explained clearly by these Principles the Virtues of *Mercury* and *Opium*, which leads me by the Hand to his Discourse *De causis diversæ molis quæ fluit sanguis per pulmonem natis & non natis.*

This learned Man in the beginning of this more learned Discourse, tells us that we should not undertake the solution of

a Problem by a great many Postulats, which may be done by a few: That is to say, we need not *Hercules's* Club to break an Egg when we may do it with the tip of our Finger. And therefore says he, "I am not pleased with those that explain the Operation of *Mercury* by a kind of Salt, like to that which is extracted from the Ashes of Plants, by the means of which it unites it self with the acid Humors, and purgeth them out of the Vessels. The Doctor is not pleased with those, and I am not pleased with him, while he pretends to explain the Operation of *Mercury* by its Gravity; because I find nothing in his Reasons but grave Nonsense, which I will weigh in a just Balance. That *Mercury* is very heavy, no Body can deny; and yet the lightest Nodules are full of it, which seems a Paradox. That it works by its Weight or Gravity, is false and absurd, which the Doctor proves himself to save me the trouble: For Gold, says he, reduced into a Liquor, or any form fit to mix with the Mass of the Blood, will have virtue pro-

"portional to its weight, and consequent-
 "ly will exceed all other Medicines as
 "far in virtue, as it surpasses them in weight.
 Here you have a Chain of excellent Dis-
 coveries, the first link whereof is Gold, the
 second Mercury, the third Silver, the fourth
 Lead, and so on according to their weight.
 Now according to this Doctrine, Gold
 being most heavy will prove much more
 effectual in the Cure of the *French Pox*,
 and some other Diseases, by Salivation
 than Mercury, which the meanest Sur-
 geon-babber knows to be false. Let Mon-
 tebanks talk what they please of their *Au-
 rum potabile*, I maintain that Gold is a much
 better Drug in the Pocket, than in the
 Stomack, and that *Aurum potandum* is ve-
 ry far preferable to *Aurum potabile*. By the
 same Rule of Proportion it likewise fol-
 lows, that Silver and Lead, being next to
 Mercury in weight, must also be next in
 Virtue, and may come up to it by increas-
 ing the Dose, as we do in other Medicines.
 Thus may you have a cheap domestick
 Drug that may serve for the Cure of all
 these Diseases Mercury is good for. But

since

since Ball without Powder is but dull and unactive, I think it will not be amiss to Charge the Piece with *Jesuits-Powder*, and then you can scarce miss the Mark. One would think here was proof enough of the wonderful effects of Gravity: But this is not all, it is a fertile Principle, and produceth many strange things. For the Doctor tells us in another of his Discourses, "That Baths, whatever their nature be, have the same Virtue, providing they be made of Liquors equally heavy: *Nam*, saith he, *operantur vi solius gravitatis*. This Discovery is altogether New, which both the Ancients and Moderns were ignorant of. For though *Bellinus* attributes something to the weight of the Liquor; yet he never dreamed that they work *vi solius gravitatis*: For he proves that the Liquor of the Bath enters into the Mass of the Blood with the Virtues of these things it is impregnat with. This Invention is worth Gold, at least it will save a great deal of Money that was expended on Journeys to the Baths in *England, France, &c.* For if you know but the Secret to make

any Liquor to have the same weight with those, it will have the same virtue, and if you doubt of the truth of it, you have the Professor's word for it. But the Improvement may be carried on further. For the same holds in Lotions, Fomentations and Embrocations, Ointments and Plaisters, that must needs work all the same way. Here is an excellent Discovery for finding out *Succedaneums* or *Quid pro Quo*. For if you want any Ointment or Plaister of such or such a virtue, if you can remember the proportion between the bulk and weight, you may presently have one like it. By this means you may make an Ointment that will have the Virtues of the Balm of *Gilead* or *Peru* externally, the basis of which may be a T---d; which will be an excellent Improvement of this domestick Commodity. As for Bathing never concern your self what the Liquor is, whether Milk, Wine or Brandy, or Cows Piss, if you please: And its no matter what it be impregnant with, Hemlock or Henbane, Camomile or Mallows, the steams of a pocky Rogue, or Musk or

Am-

Ambergrise: For if the one weigh no more than the other, you are as secure as the Professor's Word can make you. *Nam operantur vi solius gravitatis.* And thus you have a new Improvement of the *Medicina statica* that *Sanctorius* never dreamed of. But before I leave this, there is one Advice that I would give concerning Internal Baths, whether Cold or Hot, which are more frequent and ordinary in this Countrey than External ones, and it is this: That ye do not trust this Doctrine, but reject it as heretical; for though in these the Liquors work only by their Gravity, in those they work only by their Levity: For the lighter the Liquor the more intoxicating it is; for as far as Brandy exceeds Claret in lightness, so far it surpasses it in the Virtue of Fudling. But this by the by.

It's now high time to consider the main End and Design of this Discourse. You may be sure it is no Trifle; *Aquila non captat muscas.* The Design then is, to Answer a hard and difficult Question, proposed to the Learned by *Harvey*, which

is, How the *Embryo* or *Fætus* lives in the Womb after the 7 Month, without breathing in the Air by the Wind-pipe, and nevertheless if it be born in the seventh Month, it presently breaths in air; yea without breathing it can scarce live one Moment: But though it continue longer than the ninth Month, it enjoys both Life and Health. *Sect. 14.*

Here is that knotty Question that has puzzell'd so many, a great deal harder than any ever *Sphynx* propos'd to the Inhabitants of *Thebes*, and (which is sad) which no Body hitherto could Answer, till the Professor, like another *OEdipus* appear'd, or rather like a second *Alexander*, and cut asunder the Knot he could not untie. Let us hear this Mystery opened up.

I will not waste Paper in translating the Doctor's tedious, perplexed and confused way he answers the Question, but will give you the substance of it in as few words as I can. Since Life is maintain'd by the circulation of the Blood, it is necessary as well before the Child be born as afterwards. But while it is in the Womb, the
Lungs

Lungs being clapt together, the Vessels necessarily must be compress'd, and so little or no Blood can circulat that way: Wherefore it circulats from the great Vein into the great Artery, by two other ways Nature hath provided, the one a Canal, the other an Anastomosis: And so the Infants Life is preserved in the Womb without breathing. But so soon as it is born, and has once breathed in air, by which the Lungs are blown up, the Vessels are no more pressed, and so the Blood finds an easier passage through the Lungs, than by the ways above-mentioned, which therefore at last come to be stopt, and dried up, because the Blood runs no more in that Channel. Now when these ways are stopt, and no other way left for the Blood to circulat but by the Lungs, if that be stopt too, the Animal must needs dye, because the Blood cannot circulat; and this Passage is stopt when the Animal does not breath.

After the writing of this, the Doctor finding his Demonstration lame (which I cannot say it is, for it has never a Legg

to stand on, and lameness is a defect of the Leggs) he tells us in the 14 *Sect.* of his next learned Discourse, That there remains one Phænomen concerning Respiration to be further explained, which perhaps he did not make plain enough in its proper place, *viz.* 'That while the old Canals are open in a Puppie; yet if it has once breathed in air, upon the stopping of the Wind-pipe it quickly dyes, though not altogether so soon, as one that is older. I confess if the Professor answer this, he bids fair to gain the Point: For here the difficulty lyes, according to his Notion of the necessity of Breathing. But I know he can no more do it, than he can tell me how many Hairs was in *Æsculapius's* Beard, or *Pegasus's* Tail; which if he do, I am content he make a Rope of them to hang all his Adversaries, where I may be sure to have a kick among the rest. But let us hear him out, and not stop his Breath, while he is discoursing of Breathing. "For, says he, if the Wind-pipe be stopt after Inspiration, a part of the air which remains in the Lungs, is

ra-

" rarified and expanded that the Blood
 " cannot pass through them, the Vessels
 " being pressed by the elastick force of
 " the Air; and the Blood cannot all cir-
 " culate by the other Canals, though
 " they be still open, nor did it ever pass
 " all that way; and therefore the Creature
 " dies, the Blood being coagulated in the
 " right Ventricle of the Heart.

This reasoning of the Doctor's is just
 like the struggling of a blind Mare in a
 quag-mire, the further in the deeper: So
 every new Explanation he brings is a fur-
 ther degree of Confusion. The Beast in
 the quag-mire may be excused because she
 is blind: But I know not what can be said
 for the Professor who has Eyes and sees
 not, though assisted with a pair of Ma-
 thematical Spectacles. I wonder how any
 Man who has a grain weight of Mother
 wit, can think to make such Brass Mo-
 ney, or rather Fairy-money (which bears
 the Image and Superscription of Nonsense)
 pass in the World for good Coin. Here
 is indeed a Demonstration, that carries
 not so much as a shadow of probability
 along

along with it. What Countrey Clown would not laugh at such a Reason as the Professor gives for the Puppies Death, which is, That the passage by the Lungs being stopt, though the old Canals be open yet the Blood will not go all that way, because it never went all that way before. This is indeed a Witticism that surpasseth all those of *Teague-land* that ever I heard, of which the knack lies here, That either some part of the Blood knows not the way, having never trod that path before; or if it had, being but very young, it has quite forgot the way, for five or six Minuts may be as much to it, as so many Years to one well grown; and so when the poor infant Blood groaps in the dark for the way, and cannot find it, it coagulats in the right Ventricle of the Heart, and so the poor Puppie dies, because the Circulation is stopt.

But, laying Jestings aside, I'll tell you in good Earnest where I think the pith of the Argument lies, if it have any at all, *viz.* That the passage by the Lungs being now entirely stopt, which it was never before, there

there is not room enough by the other two for all the Mass of the Blood to pass. To which I say, Let it e'en step on slowly and take the more time, and it will come to its Journeys end before Night: For though the circular Motion of the Blood be necessary for Life; yet it needs not always run as if it were chased. There are scarce two in the World in whom it is equal, and Men live both in Winter and Summer, in hot and cold Climats; and so will the Puppie in spite of this Medico-mathematical Demonstration, and find to its comfort the truth of the old Proverb, That it is better to be condemned by ten Physicians than one Judge. And thus I have prevented the shedding of innocent Blood, or rather the stoping of it.

But it is pity Men should live in Ignorance, and therefore I'll bring a Child to instruct the Professor, which I hope he will not take ill: For as a Fool may give a wise Man good Counsel sometimes, so may an innocent Child, in whom the Principles of Nature are not debauch'd with too much Learning which makes Men mad,

mad, give a Lesson to a Professor of Medicine. Let us hear then how the Child will answer a paralel Case. There is a Conduit for conveying Water to the House divided into three Branches, one whereof goes to the Kitchen, another to the Stables, and a third to the Brew-house. Now Child, if one should stop rhe Branch that goes to the Stables, what will become of the Water that went thither? No doubt, says the Child, we shall have it at the Brew-house and Kitchen. No Child, that cannot be, for the Water never went all that way before. What then, says the Child, what should hinder it to go now, since there are two patent ways by which it may go? I have told you already, Child, because it never went all that way before. What will then become of it, Sir, say you? It will stop, Child, and the Water of the two other Branches will stop also, to bear it company in good manners, and so the Water will stagnat at the Fountain, and you shall dye for want of Water, and this is demonstrat by a learned Physician, who is likewise a great Mathematician. That

is none of my business, says the Child, as long as the other two Canals are open, we shall have Water in spite of his Mathematicks, and live maugre a Demonstration.

From this Mathematical Demonstration redounds a considerable Advantage to the Lieges and Damage to the Tinkers: For these Rogues when they mend one Hole, ordinarily make two, but here by stopping one, you stop three. *q. e. d.*

In this place the Doctor takes occasion to inquire into the force of Thunder that stops the Breath all of a sudden, and choaks Men in the very twinkling of an Eye. Here you shall see that the Doctor is indeed *Mystra Naturæ*, penetrats into the inmost Recesses of Nature.

The Reason the Doctor gives for sudden Death occasioned thus, is, "The sudden and great Expansion of the Air, whose Particles, says he, become both lighter and larger, and so cannot enter into the Lungs: And so the Blood cannot circulate because the Lungs will clap together and compress the Vessels: And therefore the Creature who is thunder-struck must pre-

presently dye, the Circulation being stopt. The Doctor told you just now, That the Puppie dies, because when once it has breath'd in air, some Particles which remain still in the Lungs are so rarified and expanded, that they blow up the Lungs to such a degree, that the Vessels are pressed together, and the Circulation stopt: And here you are told that the Circulation is stopt meerly because there is no air in the Lungs at all; which is indeed very odd that it should fall out just at the very nick of time that one is killed with Thunder. Whereas I think it would fall out quite otherwise; for the Particles of the Air that are in the Lungs would be affraid to come out for the Thunder. The Professor says, he was the more confirmed in this Opinion, by seeing one opened who
 “ was killed with Thunder at *Edinburgh*,
 “ where nothing was to be observed that
 “ might occasion his Death, except this
 “ wonderful shrinking and clapping together of the Lungs.

Here is a wonderful Explication of the wonderful Effects of Thunder, and of its way

way of working. And here I cannot but wonder that this Mathematical Archer, one of the true Sons of *Apollo*, should never once hit the Mark with his geometrical Arrow; One hit for the Honour of the Nation, that we may not be ashamed of our Glory. But let us examine this thundering Gibberish.

“The Air, says he, being expanded or rarified, it cannot enter into the Lungs. What then? Cannot we live a Minute or two without Air? No doubt and more. How comes it to pass then, that those who are thunder-struck fall down dead in an instant, as one shot through the Head? But why should the Air, being rarified, not enter into the Lungs? Because, says the Doctor, the Particles become larger and lighter. Here is an excellent Dish of Nonsense dressed *a-la-mode*. For any Body knows that in rarifying of Liquids the parts become not larger but less, for one is divided into a Thousand or more indefinitely. If the Air were like to Brass, or any other malleable Matter, what the Doctor alledgeth might follow. The Particles

cles of the Air then by Rarification become more subtile and penetrating, and rush hither and thither on all quarters with the greater violence, according to the force of the Impellent; which will be so far from hindering it to enter into the Lungs, that it will rather run into them like a Torrent, and by blowing them up press the Vessels, and so stop the Circulation: And consequently if any dye by this Accident, it must not be for want of Air, but for having too much. Moreover one would think that in this Case the Air being rarified, would become like a large Cupping-glass, and occasion not only the swelling of the Lungs, but of the whole Body, rather than their clapping together. The Example of the Lungs being clapt together in him the Doctor saw opened, is so Childish that I almost blush to repeat it. What! does not every Body know, that those who die either a natural or violent Death, if their Wind-pipe be open, dye in the act of Expiration, and not Inspiration? And therefore we say when any Body dies, That they breath'd

Out

Out their last, and not that they breathed In their last; and so no wonder the Lungs be clapt together. Moreover if the Expansion or Rarefaction of the Air be the cause of this Phænomen, how comes it to pass that many are scorched with Thunder and Gun-powder who are killed by neither, since there is reason to believe the Air as much rarified in these as in the above-mentioned Case? If this Doctrine hold, it will make one afraid of a very F---t, for that expands the Air after its own fashion, as is evident by the Crack.

Being now almost breathless in pursuing this Demonstration about Breathing, it is high time to refresh our selves a litle: Wherefore I will intertain you with the Doctor's Discourse, *De motu quo cibi in ventriculo rediguntur ad formam sanguini reficiendo idoneam.*

Here I promise you a Dish of as well dressed Chile as ever you tasted. Nothing could come in better season after a Treat of Air, which though it be absolutely necessary for our subsistence, yet it is but a lent Diet: alone, there must be some more

H

solid

solid substance, to make this Vestal Flame, or lamp of Life burn: Even as in Fire, which without both goes out. This solid Substance I confess is easily found; but all the matter is to know how it is digested and turned unto Nourishment; which is as necessarily for a Physician to know, as it is for a Cook to understand how the Fire assimilats its Fewel, and whether or no the igneous Atoms that insinuat themselves into the Pores of the Meat while it is a boiling or frying, be nothing but raments of the third Element sweeming in the first, as Fish in Water, before he can make you a good Potage, or Fricasie of Chickens.

The Doctor in order to the establishing of his own Opinion, first refutes his Adversaries. And here he is like to have a hard pull for it (for the greater the Opposition, the more glorious the Victory) for he has a number of Surly, Sour-looking, Saucy Fellows to encounter, armed with four and salt Ferments, and *Stygian* Liquors, and *Vanhelmonts* *Archæus*, and *Dolæus* Bogles to grample with: Wherefore

fore he had need of Armour that is proof:
For these Ferments cut like *aqua fortis*:
But the *Archæus* and *Lemures* are worst of
all, for nothing will do with them but
Conjuration.

We come now to the Question to be
answered. *viz.* How the Meat is to be
digested. *i. e.* What Power, or Faculty,
or Ferment, dissolves the Meat in the Sto-
mack, and makes it fit for Nourishment?

Many different Opinions have been a-
bout this, as well among the Ancients as
Moderns. The Opinions of the Ancients
were Four. Some followed *Hippocrat*, who
affirmed Heat was the Cause of Conco-
ction. Others maintained with *Plistonius*,
the Disciple of *Pythagoras*, that the Meat
did putrifie or rot in the Stomack, and so
that Concoction was Putrefaction, and con-
sequently that the Stomack was a kind of
Dung-hill. The Third was that of *Era-
sistratus* (and this is the Doctor's, which I
believe he takes to be new, though it be
more than 1600 Years old) who held, that
Meat was bruised or grinded in the Sto-
mack, and so the Stomack by consequence

was a kind of Mill, and digesting nothing but grinding. The Fourth maintained with *Asclepiades*, that what we call Concoction is no Concoction at all, but that the Meat raw and undigested as it is eaten, is distribute through the Body. This was the briskest Fellow of them all, who came in at the broad-side, and told them that they were debating about nothing, for there was no such thing as Concoction. I wonder the Doctor was not of his side, since they seem to be of a party: For as this Man maintained that Concoction was no Concoction at all; so the Doctor gives us Demonstrations which are no Demonstrations at all.

Among the Moderns some followed the Ancients: Others, salt and four Ferments, some had recourse to the *Archæus*, &c. The Doctor only begs one thing for to refute his Adversaries Opinions, which is so just that no Body can refuse it, viz. "That
 " whatever the Cause of Concoction be,
 " it must be such that will not either dis-
 " solve the Stomack, or other solid Parts
 " of the Body, as it were with a chymical
 " Fire,

“Fire, or *aqua fortis*. This is altogether as reasonable as to demand, that the Pot that boils our Broath be such as the Fire will not melt down while the Broath is a boiling. This being granted, the Doctor soon stops his Adversaries Mouths, by asking them, “How it comes to pass that that which “dissolves the Meat in the Stomack, whether it be Heat, Ferment, or Putrefaction, does not dissolve the Stomack also, since it dissolves not only Meat of “the same kind, but that which is much “more solid?

I verily believe, that not only the Doctor himself, but his Admirers also thinks this an insurmountable difficulty, which no doubt has made him reject these Opinions, and embrace one so absurd, as his will be found. It is strange to see how Men are in love with their own Dreams and Delusions, and how they see other Mens Faults, and are blind to their own. For the same Objection that is against these Opinions, holds against the Doctor's. For if he ask them, how it comes to pass that the Stomack is not dissolved as well

as the Meat in it? They may ask him, how it comes that the Stomack by bruising and grinding Meat of the same nature with it self, and much more solid too, is not grinded to dust and crumbled away to nothing long ere now? The Doctor Answers, That whatever damage the Stomack sustains that way, is soon repaired by the Blood. Whatever force is in this, it makes as much for any of the contrary Opinions as for his; and so the Stygian Lake, or Chymists Laboratory, or Cooks Shop, or Dung-hill, may maintain its Right against the Mill. I am sure none but these that think very litle, or drink very much, would find any difficulty in this which puzells this learned Man so fore, that he thinks it unanswerable. For the things which we digest, cannot properly be said to be of the same nature with our Stomack, or other parts of our Body; for they differ as much as living things and dead: For what we eat must first die, and cease to be nourished, before it can be digested. And were the Stomack and other parts of the Body of the same
na-

nature, as the Professor alledgeth, with these things we digest, we should ly under the same necessity of preserving our Bodies with divers Pickles and Spices, as we are to keep Beef and Mutton from corrupting with Salt; and so we should be all talking and walking *Mummies*. But lest the Doctor understand not this, I remit him to the School-master of Fools for instruction, who will inform him that Worms live frequently in the Stomack, in spite of Heat, Fermentation, Putrefaction, &c. and sometimes in spite of Physick and Physicians too.

Thus you see the Professor has given his Adversaries a Morfel they can never concoct: But lest it may chance to putrifie, he must prevent that too, and take another word of *Dr. Lister*: For the Professor cannot away with this old musty stinking Opinion, and no wonder, for it turns his Mill into a Jacks, and makes it good for nothing but grinding T---s. "There are
 "other Reasons, says he, why we reject
 "the Opinion of the learned *Mr. Lister*.
 "For this Gentleman will needs have the

“ Meat to rot in the Stomack, because it
 “ is in a warm place, without the Animal,
 “ But this (says the Doctor) does not an-
 “ swer the Question, for one may still ask,
 “ What is the reason that Flesh out of
 “ the Stomack does not corrupt or putri-
 “ fie so soon, or if it do, it does not turn
 “ to Chile? Which nevertheless the same
 “ Flesh will do in the Stomack, in a very
 “ little time. This is just such a Question
 as if one would ask, Wherefore the wind
 of the Microcosm smells worse than that
 of the Macrocosm, and why the Vapours
 pent up there corrupt so soon? But I won-
 der the Doctor does not see that this will
 put the Water by his Mill, and hinder it
 to go, except he make it go with wind, of
 which he never wants plenty. For I would
 ask him, How it comes to pass, that the
 Stomack of any Animal, taken out and fill’d
 with Meat, and pressed between the two
 Hands, never turns the Meat into Chile,
 which nevertheless it will do in a very
 short time when the Stomack is in the Ani-
 mal? The Doctor will readily Answer,
 that it is not Motion considered in gene-
 ral

ral that is the Cause of Concoction, but a certain kind of Motion, so and so circumstantiat, peculiar to the Stomack. So will his Adversary reply, that it is a certain kind of Putrefaction that cannot be defined, and yet Putrefaction it is, or Corruption still, and is a juster Notion of the thing than any I have met with. But among all the Opinions I have met with, none is so ridiculous and absurd as the Doctor's, as he has stated it. For to tell us, that the motion of the Stomack may contribute to the Concoction, is that which no Body will deny: But to say it is the adequate efficient Cause (for the Doctor assigns no other) is every whit as absurd as to affirm, that because Meat helps to preserve our Life, therefore we need neither Drink, Sleep, nor Air. Yea it is manifest to any considering Man, that from the Motion of the Stomack we can no more have an Idea or Notion of Concoction, than from the Idea of a Wind-mill, we can frame one of a Solan-goose.

But notwithstanding of the Absurdity of this Opinion, I am content to let it pass for

for it usefulness. What can be of more excellent use than this Doctrine? For sick People whose Stomacks are weak, and Digestion bad, may have Chile prepared in a Dog's Stomack, which must be taken out of the Dog either dead or alive, and any kind of Meat put into it you please, which by tossing up and down a few Hours will turn into Chile, fit for nourishing the Patient, whose Throat if it chance to be closed, it may be injected into the Veins. This new Invention will quite discard Consumes and Gelees, and in place of that Physicians will order thus. *R. Chyli bene præparati & in ventri: canis. a. digest: un: iij. &c.* After all we are no further concerned with Concoction, than to know what is easily concocted: And to take care that there be some proportion between the solid and the liquid, otherwise the Mill will never grind well, whatever some Physicians may say to the contrary.

I am now come to the Doctor's last Dissertation, *De circulatione sanguinis in animalibus genitis & non genitis*, which is the most sublime of all, & very proper to crown the work:

work : For the other Discourses were but Medico-mathematical, but this is Mathematico-medical. It is dedicat *Mathematicorum Amantibus, To Our Right Trusty and well beloved Cousins and Counsellors the Mathematicians, greeting.* I can compare it to nothing so fitly as a Beggar's Cloak, which is made up of Clouts of divers Colours, some new, some old: Or rather to a frugal Supper, where the cold Meat that was left at Dinner, is served up again to furnish out the Table, with the addition of some litle Kick-chaws. For the Doctor presents you here with a cold Dish of his *Problem de Inventoribus* warmed again.

The principal Design of this Discourse is to demonstrat the Advantages that redounds to the World by the Discovery of the Circulation of the Blood. But before the Doctor come to this, he demonstrats that *Harvey* was the first Discoverer of this great Mistry, and that the good old Man *Hippocrat* knew no more of it than he did of the *Irish* Tongue: And he is so hot and eager in the pursuit of this, that

one

one would think he had forgot his main End, and himself too.

The Circulation of the Blood (says the Doctor in the beginning of his *Dissert:*) is the ground and foundation of all Medicine. And therefore we need not wonder that he look on the Ancients with an Eye of disdain and contempt, as ignorant Dunces, since they were ignorant of this Foundation, on which Medicine is built: And despise also the Moderns, who though they know it, still practise after the old fashion, and use Derivations and Revulsions and Bleeding at different parts of the Body. And therefore if those deserve to be beaten with few stripes, these deserve to be soundly whip'd: For those were blind, but these have Eyes and see not, and no wonder since they make no use of Mathematical Spectacles. Let us hear then the practical Improvement the Doctor has made of this Noble Invention? The original Cause of the Apoplexy, Lethargy, Coma and other Diseases of the Brain, were as little known to the Ancients (if we give Credit to the Doctor) as the

Head

Head of Nile. The Divine *Hippocrat* himself was forced to recur to the *asylum ignorantiae* of *Divine*: And the Moderns for all their fair and specious pretences, have said no more. And no wonder since they sought the Cause where it was not, imagining it was to be found in the Nerves and Pores of the Brain, whereas all this time it lurk'd in the Arteries like a Fox in his Den, and might have done so still, had not this Mathematical Hunter, getting the Advantage of the Wind, ferreted it out of its Hole. Now if you desire to know how the Doctor found out the true Cause of these Diseases? It was by the Mathematicks, as you shall see by and by. For after a tedious Discourse of the different Figures of the Conduits or Vessels through which the Fluids run, some whereof have their sides convergent, some divergent, and others paralel, he concludes that it is chiefly in those whose sides are convergent, where reasonably we may expect Obstructions: And since the Arteries are such, we are to seek the Cause of the above-mentioned Diseases in these, which
for-

formerly was supposed to ly in the Nerves.
The Case is plainly thus in a few words.

The Vessels or Conduits through which any Liquor runs, are either such as are larger and wider, at the place where the motion begins, and become still narrower and narrower the further they go: Or narrower where the motion begins in them, and still grow wider the farther they go: Or they are equally wide all along from the one end to the other. We have not, according to the Doctor, much reason to suspect any Obstructions in the two last, but only in the first, because what goes in at one end, will easily go out at the other, and therefore we are to seek them chiefly in the Arteries, which grow still narrower the further they are from the Heart; which come to be obstructed thus, according to the Doctor.

“ The litle solid Particles that sweem in
 “ arterial Blood, when they come to meet
 “ together in any part of the Arterey,
 “ where the passage is strait, make as it
 “ were a kind of Arch, or Vault, which
 “ is supported by the sides of the Artery

“ in-

"inclining one towards another. And it
 "is evident (says he) that this Bar, or
 "Stop, will be the stronger the more it
 "is pressed by the current of the Blood.
 And thus you have the true Cause of the
 Obstructions that befall the Arteries ne-
 cessarily by the Laws of Mecanism. But
 there is one thing especially to be obser-
 ved in the building of Arches, which is,
 That the Butresses or Supports on which
 the Arch stands, be such as will not easi-
 ly yield, otherwise down it comes in a
 trice. Now the sides of the Arteries be-
 ing in a perpetual motion, it will be as
 hard to build a Bridge between them,
 while we are alive, as to build a Castle
 in the Air: And therefore the only fit
 time to begin this geometrical Arch is,
 when we are dead: For the motion of the
 Arteries being then ceased, there is sure
 Ground for laying the Foundation. By
 which you may understand what a false
 and groundless Notion this is, That Ob-
 structions are more frequent in the Arteries
 than in the Veins or Nerves, which I con-
 fess the difference of the Figure would oc-
 ca-

caſion, if all other things were equal; but the perpetual motion of theſe, marrs all. But falſe and groundleſs as it is, it is all the Argument the Doctor has to refute the Opinion of *Sylvius* and *Willis*: Which being done, he proceeds to explain his own Opinion of ſleepy Diſeaſes, as Apoplexy, Lethargy, &c. and at the ſame time gives us a juſt account of the nature of *Opium*.

“ It is evident (ſays he Parag. 24.) that
 “ upon the taking of *Opium* there follows
 “ a warm Sweat, and that the Blood in the
 “ beginning is rarified. If therefore ſuch
 “ a quantity of *Opium* be taken, as may
 “ rarifie the Blood in the Brain to ſuch a
 “ degree, that the little Arteries that are
 “ mixed with the Nerves there, may preſs
 “ them more than ordinary, and ſo hin-
 “ der the free paſſage of the nervous Li-
 “ quor, the Creature will ſeem to ſleep,
 “ and all theſe things will fall out which
 “ we obſerve in ſleep and ſleepy Diſeaſes,
 “ proceeding from a Cauſe within the Veſ-
 “ ſels. Whence it follows (ſaith he Par.
 “ 25.) that Wine and Spirit of Wine, and
 “ all Liquors that are rarified eaſily and
 ſud-

" suddenly, by heat or any other way,
 " may occasion Sleep and sleepy Diseases.
 " Yea Liquors that are not apt to rarifie,
 " if they be taken in a sufficient quantity,
 " and carried in such abundance to the
 " Brain as is requisite for dilating the Ar-
 " teries sufficiently, and consequently for
 " pressing the Nerves. Therefore we need
 not wonder that some are drunk with
 Water.

One would think, that while the Do-
 ctor is speaking of sleepy Diseases, and
 the Qualities of *Opium*, that he were asleep
 himself, or had taken a Grain or two of
 the Juice of the Poppie, this Discourse
 looks so like Raving. For if the Cause
 of Sleep, and sleepy Diseases, be the Ra-
 rification of the Blood, then every thing
 that rarifies the Mass of the Blood would
 occasion these Diseases, that is, every
 thing that is proper for Curing the Apo-
 plexy, &c. would likewise occasion it. As
 Spirit of Hart-horn, salt Armoniack, Oyl of
 Amber, Rosemary, Tincture of Castor,
 &c. which are Remedies used with good
 success in those Diseases, and rarify ex-

ceedingly the Mass of the Blood, would inevitably either bring on or increase the Malady. This is one of the most wonderful and useful Discoveries that ever the World was blest with, and will make any Body a Physician in a trice. For when you come to a Patient, you have no more to do, but ask him what was the occasion of his Sicknes? Was it a surfeit of a Venison pastie? Then be sure to eat as much the next day, and you shall be Fish-whole. Was it a surfeit of Drink? Then take a Hair of the Dog that bit you: For

*Si tibi nocuerit hesternæ potatio vini
Cras iterum bibes & erit tibi medicina.*

[Cure,

If Sicknes caused by Drink you mind to To drink just as much the next day be sure.

So much of the nature of sleepey Diseases and their Cure, both Mathematically explained. I come next to examine the somniferous quality of *Opium*.

I will not trouble you at present with the different Opinions either of the Ancients or Moderns, concerning the Nature and

and Virtues of Opium, especially where its somniferous quality lies. Some maintained it was Heat, others Cold; some a Viscosity, others a Narcotick, Sulphur, &c. But most were of Opinion, that it is an occult Quality, that is to say, they knew not what it was. And this no doubt is the only right Opinion, and is excellently well expressed by *Thomas Diaphorus* in the *Malade Imaginare*. *Quare facit Opium dormire Thoma? Quia habet virtutem dormitivam.* No doubt the Professor thinks this a very ridiculous Answer, otherwise he had never given himself the trouble to seek out another, which nevertheless upon trial will be found to bear the same Image and Superscription.

But the Professor must say something: He is obliged to it by his place: For one that has a publick Salary for Talking or Writing, is obliged to chat, tho he should speak Nonsense; as well as a Town-piper is bound to play through the Streets Morning and Evening, though he should play quite out of Tune. For a dumb Professor is as useless a thing, as a Piper that

wants the nether Chops, or a Fiddle without Strings.

Opium then, according to the Doctor, makes one sleep, because it rarifies the Blood, which is evident, says he, because it provokes a warm Sweat; Whence it follows clearly, that every thing that rarifies the Blood, *i. e.* every thing that makes one sweat will provoke Sleep, and have all the other Virtues of *Opium*, *i. e.* all *Sudorificks* will be *Opiats*; *i. e.* this is all stark Nonsense. But Nonsense as it is, many Advantages attend it. We shall not need to go far to find *Laudanum*, for almost every thing will afford it in plenty Sometimes, *you know what*, may supply its place, for the very sight of it, much more the smell or taste, will make one sweat. Yea the most troublesome and uneasy Passions we are subject to, even those that disturb our Rest and hinder Sleep, will furnish us with a *Quieting Draught*: For Anger and Vexation, &c. which make Men sweat to purpose by their *Sudorifick*, *i. e.* their *Somniferous Quality*, will quickly

allay our Passions and lull us asleep, even as

----- *Dolor est Medicina doloris.*

By this you may clearly see, that *Thomas Diaforus* and the Professor, give the same Answer in different Terms: And no wonder, since great Wits for the most part agree. *Thomas* says that *Opium* makes one sleep because it has a sleeping Quality in it: And the Professor tells us, it is because it has a rarifying Quality. But since every thing that rarifies the Mass of the Blood (that is, every thing that makes us sweat) does not provoke Sleep, this rarifying Quality of *Opium* must have some speciality or specifick Virtue in it, that no Body knows, *i. e.* an occult Quality, a sleepy Virtue, *Virtutem dormitivam.* Which was the thing to be demonstrat. Now since the Professor has answered every whit as well as *Thomas*, no Body in Justice can refuse him the same Complement. *Bene responde-re, dignus est intrare in nostro docto corpore,* and to be a Professor in any University of *Christendom.*

But I must ask the Professor one Question about *Opium* before I have done, which is, That since Sleep and Sleepy Diseases are occasioned by the Dilatation of the small Arteries in the Brain, which press the Nerves, how it comes to pass, that the Arteries that are intermixed with the Nerves that serve for Respiration and the motion of the Heart, are not pressed as well as those which serve for voluntary motion and sensation, and consequently why Sleep does not alway occasion a difficulty of Breathing? To this the Professor answers very wittily, " That the Heart " which is a Muscle, and the Muscles of " the Breast have no Antagonists, and " therefore few Animal Spirits will do " their turn. And therefore though it can not be denied, that the Nerves that go to the Heart and Breast must be pressed by the Arteries, as well as the rest, yet neither the Pulse nor Breath get any sensible hurt by it, when the Dose is moderat, or the Sleep natural: Because a very few Spirits is sufficient for this great Work, there being no Antagonist Muscles to hinder

der it: And very little will do a great deal where there is no opposition in the way.

Now this Discourse of the Doctor's about Antagonist Muscles, is antagonist to Truth, and antipodes to Sense and Experience. As for the Heart, its Diastole is as natural as its Systole: And tho it cannot be said to have an antagonist Muscle, yet it has the equivalent, yea in my opinion a stronger Adversary to grapple with: For, besides the *motus restitutionis*, which is very near in kin to antagonist Muscle, it has the Blood to squirt out into the Arteries, which requires no small force. But any Body that has seen live Dissections, and thrust their Finger into the Heart of a dying Animal, will find that no small stock of Spirits is necessary for such a task.

What he says concerning the Muscles of the Breast, is so gross a Mistake, that the meanest Student in Medicine would be ashamed to fall into the like: For they have antagonist Muscles, and these considerable ones too, tho the Doctor alledgeth they may be reckoned as good as none at all: But he may turn the Tables and rec-

kon over again, and he will find the contrary. Is the *Sacrolumbar*, the *Triangular* and the *Internal Intercostals* of no force at all? Here is the depth of Anatomy. But if those be not sufficient alone, they have the confederat Troops of their Allies, the muscular Fibers of the *Aspera arteria* or Wind-pipe to assist them at a Call. And I assure you sometimes they stand in need of their help; as in the Acts of Coughing, Singing, Laughing, &c. all acts of Expiration, in which the Breast is contracted, and require more Spirits than any act of Inspiration I know. But why should we multiply Causes without necessity? Gravity alone is sufficient to do the thing, thus. When we breath in Air, the Chest of the Breast is enlarged, and the Ribs are pulled upwards, in so much that the oblique Angles they made with the Backbone, becomes right ones; all which is performed by the Muscles that serve for Inspiration; and when these remit their action, the Breast by its own native Gravity falls down again, and shrinks into its former shape; in which it remains till the

Mu-

Muscles pull it up by the Ears again. And this is the Doctor's Opinion of the matter, in his Discourse, *De causis diversæ morbis, &c.*

This Doctor is the luckiest Man that ever breath'd, for finding out *Succedaneums* or *Quid's pro Quo's*. We wanted here an Antagonist Muscle to help the Breast down again. The Doctor tells us, the weight will supply the place, no more is necessary. We tumble down the Hill of our own accord, but we must have force and strength to mount up again. Now the weight of the Breast being sufficient for the act of Expiration, and doing the duty of an Antagonist Muscle must resist the act of Inspiration, as much as if it were one, and therefore there will be need of the same supply of animal Spirits, to overcome this weighty Adversary, which would be necessary to vanquish an antagonist Muscle: And consequently the same Dose of *Opium* that makes one sleep, would stop both the motion of the Heart and Breast, if its somniferous Virtue be such as the Doctor has assigned: Yea, Sleep it self would kill without Mercy.

From

From this Opinion, that Expiration is performed by the weight of the Breast, many weighty Instructions may be deduced for the good of Mankind.

The *First* is for Nurses, either wet or dry, that they take special care, when they hold out Children, that their breech be not higher than their Breast: For in this posture, if they chance to breath in Air, which they must needs do, in order to blow something out at the other end, if in this posture, I say, when the Ribs make right Angles with the *Spina dorsi*, they chance either to be perpendicular to the Horizon, or make acute Angles with it, in a very few Minuts the Child will dye, tho not breath out its last; because there is no antagonist Muscle to draw the Ribs down again, and the weight cannot determine them one way more than another, while they are pendicular, and in the other Case it will determine them the quite contrary way. They must also take notice that Children never go on all Four; for then the Gravity which served for Expiration will now help Inspiration; by which means the

the motion of the Breast will cease, and the Infant breath in its last.

The *Next* Instruction is for Jockies and Ferriers, to teach them how to Cure wind-broken Horses. Which is done by making them walk on their hinder Legs upright, or ly on their Back: For in either of these postures the weight helps the Expiration, but in their natural posture it hinders it.

The *Third* and last is for Trumpeters and Pipers, &c. who to make them blow better, should lay a weight on their Breast, as Smiths do on their Bellows, which will very much help their Expiration: And even Experience teacheth us, that pressing the Belly will make one rift at the wrong End, which is a kind of Expiration too. Are not these useful Instructions both for Man and Beast?

By what has been said, any Body may be fully satisfied of the power and efficacy of this Geometrical Method in Medicine, and that the Mathematicks are absolutely necessary for a Physician; even altogether as much as the knowledge of the Ovals is for the General of an Army. And
that

that you may not take this for a Jest, I must tell you it was pronounced in earnest by the infallible Judge of Controversies the Pope, in favours of one of his Nephews; for which he gave these Reasons, it being pronounced *extra Cathedram*. He that understands the Chess, said he, knows how to muster his Men, to draw them up in battle Rank, to Attack, Defend, Fortify his Camp, Pursue his Victory, Secure his Retreat, &c. And these are the only Qualifications necessary for a General. Now no Body can deny but that the Professor has at least as fair a Plea for Infallibility in his Conclusions pronounced in *Cathedra*, as the Pope has for his Decisions *extra Cathedram*. From all which it follows clearly that the Mathematicks are as necessary for the one, as to play at Chess for the other.

But lest you call the Professor's Authority in question, I'll draw the paralel more exactly, and shew you that there is just as much reason for the one as the other, there being the same affinity between Medicine and Mathematicks, that is between
the

the Art of War and the Chess. For Medicine is nothing but the Art of making War against the Enemies of the Microcosm, these *Hostes humani generis*. And the Physician, who is the Warriour, must understand how to fortify the Place regularly, and defend it against the Attacks of the Enemy. And this is that part of Medicine we call the *Preservative*. He must likewise know, how to expell the Enemy when entered the place, either by Force or Stratagem; to beat them off with Bullets of *Mercury*, and blow them up with *Jesuits-powder*, which is as necessary in Medicine as Gun-powder in War. Now no Man is able to do this well, and to purpose, but he that understands Fortification, which is a part of the Mathematicks. *Ergo* no Man can be a good Physician except he be a Mathematician. *Q. E. D.*

Now I have done with *Mathematical Medicine*. And what I have said of its real Worth and Excellency, will sufficiently convince the *Learned Mob*, and all these that admire what they know not (for whose Instruction this was written) that
its

its Author is not only a deep Philosopher, and profound Mathematician, but the most eminent Physician that ever this poor Nation was blest with. And if any Man be either so dull, as not to assent to a Mathematical Demonstration, or so humorsome and perverse, as to struggle against his own light, he ought to be cudgell'd into compliance, and forced to confess with his Mouth what he cannot believe with his Heart, and cry out with the Rable, *Great is Diana of the Ephesians, the Image that fell down from Jupiter.*

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A
DISCOURSE
OF
CERTAINTY.

Wherein you have a
FURTHER PROOF
Of the *Power* of the
Mathematicks,

AND OF
The *Profound Knowledge* of A. P. M. D.

*Ille decus Patriæ & splendor: non sydere tanto
OEbalii micuere Dii, quos naupa solutis
Puppibus, & jam jam vicentibus invocat undis.*

Printed in the Year, M. DC. XCV.

A
DISCOURSE
OF
CERTAINTY

Wherein you have a
FURTHER PROOF
Of the Power of the
Satanicall

AND OF
The Profound Knowledge of A.P.M.D.

His own Private & Splendor: non sibi tantum
Quodam mittere Di, quos natura solent
Proposuisse, & jam jam vicissim innotuit.

Printed in the Year, M. DC. XCV.

TO THE READER.

Reader,

IN the preceeding Discourse you have a Conjectural Art turned into a Certain Science, and, by a strange kind of Metamorphosis, Delirations transformed into Demonstrations: And in this, you have an Attempt made, to turn Certainty into Conjecture, and the Truth into a Lie: And all by the Power of the Mathematicks; which, like Circe's magical Rod, turns Men into Swine, and Swine into Men. And as the Principles laid down in the former lead to Empiricism, so these of the later tend to Scepticism, as to Matters of fact. And as he that regulats his Practice in Physick by the first, will at best prove nothing but a Mountebank; so he that founds his Belief on the last, will prove little better than a Deist or Infidel. Now altho these Consequences natu-

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rally follow from the Principles laid down in the one and the other; yet I do not accuse this learned Man of any thing but sublime Inadvertency. Some Men speak before they think, and these for the most part know not what they say; and so can hardly be guilty of Malice, tho they may be accused of Rashness. But since he that kills a Man by meer Inadvertency, as really kills him as he that does it deliberately and on design, and the damage is the same, tho the guilt is not. Therefore I would advise these blind Archers, not to shoot any more at random, nor draw their Bow at a venture: For they may do more Mischief than they are aware of. And if they continue to do so after Admonition, that which in Charity was thought Rashness before, will now justly be reckoned Malice and Design; and the Offender no longer a Man-slayer, but a Murderer.

I had not concerned my self with this impertinent piece of Stuff at this time, were it not that there is a Set of Men sprung up, who call themselves Deists, (but who for the most part are down-right Atheists) these pretend to be the only Men of Logick and Disputa-
tion

tion, who make the learned Mob stand amazed at the wit and profoundness of their idle Chat, as if they had seen the Gorgons Head: And a Gnat is not more troublesome with its little Sting and Buzz, than these Smaterers with their small Sophistry. These Wits impudently tell us, That nothing is certain but a Mathematical Demonstration, and that all historical Certainty amounts to no more but a meer Conjecture, and that the best attested History is little better than a Romance: Tho the best Reasons they bring to maintain this Paradox, are little better than the Dreams of Enthusiasts, or Ravings of sick Folks. The truth of which will easily appear to any that will give themselves the Trouble to read attentively the following Discourse.

them, who make the learned that stand upon
 and at the top and underneath of their little
 (that is) they had seen the Gorgon's Head.
 And a Goat is not more troublesome with its
 little Sting and Bore, than these Satyrists
 with their small Sophistry. These 16 lines in-
 probably tell us, That nothing is certain but
 a Mathematical Demonstration, and that all
 historical Certainty amounts to no more but a
 mere Conjecture, and that the best mixed
 History is little better than a Romance. The
 best Reason they bring to maintain this
 Romance, are little better than the Dreams
 of Philosophers, or Ravings of sick Folks. The
 kind of which will easily appear to any that
 will give themselves the Trouble to read at-
 tention to the following Discourse.

A DISCOURSE of CERTAINTY.

TH E R E is Nothing more certain than that Something is certain: And he that maintains the contrary gives himself the lie. But what *Certainty* is, can better be conceived than expressed: For every Man at the hearing of the Word, if he understands the Language, has presently an Idea of what is meant by it. Whatever we assent to, we think it either Certain or Probable: Our Assent to the First is called *Knowledge*, which comprehends both that of Principles and Conclusions, which the Schools express by *Intelligentia* & *Scientia*: And our Assent to the Last is called *Opinion* or *Conjecture*.

Some distinguish Knowledge or Certainty into Three kinds, Physical, Mathematical, and Moral. The two first of these

they call Infallible, not in an absolute (for that is an Attribute of GOD) but a qualified Sense, which supposes our Faculties to be true, and that we exert them aright: And the last they stile Indubitable Certainty. The Authors of this distinction seem to me to contradict themselves: For they grant that Moral as well as Physical or Mathematical Certainty, excludes all kind of doubting whatsoever; and yet at the same time they deny, that it has as great evidence as these: That is to say, we have no more reason to doubt of what is Morally certain, than of what is Physically, or Mathematically so; tho we have not the same reason for believing the first, that we have for the two last, *i. e.* we have both the same Reason, and not the same Reason, to Believe, and not Believe the same Things equally at the same time. The fault of these Men is, that they comprehend under Moral or Indubitable Certainty, Things of a very different nature, and, in my humble Opinion, confound Indubitable Certainty and high Probability together. For the Certainty that

that I have, that the Sun rose Yesterday, and that I have that it will rise to Morrow, tho vastly different, are both stiled by them Indubitable; whereas only the former is such: For tho the later be so certain, that I have no such reason to doubt of it, as to be in continual fear of the contrary; yet it comes not up to the certainty of the former, of which I have as great assurance, and every whit as well grounded, as of any Proposition in *Euclid*.

Opinion or *Conjecture*, is an Assent given to things less clear and plain, for which tho a great deal may be said, yet the Proof does not arise to that degree of Evidence, as to beget a Certainty that excludes all reasonable doubt, and fear of the contrary. And these are the two Heads to which Assent is reducible.

Agreeable to this our problematick Doctor in his *Problem* Pag. 12. teaches us, That whatever things we assent to, are either such as are *Demonstrat* or not *Demonstrat*. " By things demonstrat (says " he *ibid*;) I understand, *Ea quorum probationes consueverunt impossibile esse ut ipsa se ali-*
" ter

ter habeant, unde sequitur ea semper eo-
dem modo se habere. But by things
 not demonstrat, I understand (says he)
Ea quorum probationes non conficiunt ip-
sa aliter esse non posse ; unde concludi ne-
quit ea semper eodem modo se habere.
 The Arguments that agree to the for-
 mer, are called Demonstrations, and these
 that agree to the later Probabilities. That
 is in a few words, Whatever is demonstrat
 is so certain and true, that it is impossible
 it should be false : But that which is not
 demonstrat is never so certain, but that it
 may be false, a cheat and a lie, for any
 thing we know.

One at first sight would think, that the
 Dr. were of the same mind with those I just
 now mentioned, but there is a vast diffe-
 rence. For these maintain, that beside Phy-
 sical and Mathematical, there is likewise
 a Moral Certainty, which is as certain as
 any of the two ; and that many Matters
 of fact are capable of this kind of Certain-
 ty. Whereas this learned Man holds,
 that nothing is infallibly certain, but a De-
 monstrat ; and that all other Certainty,

even

even that which depends on the faith of History, is nothing but Probability and meer Conjecture; and consequently all the Infallible or Indubitable Certainty we can expect from any History, tho never so well attested, is, That it is infallibly uncertain; because all History whatsoever supposeth, according to this learned Author, some things that cannot be demonstrated, which weakens exceedingly its credibility, and makes it amount to no more but a *may be*. But that I may not be thought to mistake the Dr. let us hear him out, that we may the better understand his meaning:

“ Moreover (says he) ye must know, that these that give credit to the Author of any History, that is, who propose to themselves an Author, whose Authority enters the state of the Question, necessarily suppose these Effata or Oraeles (which according to him are as false, as ever any pronounced by the Delphick Demon) First,

“ 1. That we should always believe our Senses.

“ 2. That the Authors of the said History delivered always to others the ve-
“ ry

“ry same things they knew themselves by
 “the Testimony of their Senses. *Which is*
 “*not demonstrat.*

“ 3. That these by whom the said Hi-
 “story has been handed down to us, were
 “such Men, that they always delivered
 “to Posterity the very same History, which
 “they received from their Predecessors.
 “*Which is not demonstrat.*

“ 4. If an History be old and not writ-
 “ten, then we must take for granted that
 “these by whom this History has been
 “handed down to us, never forgot any
 “Particular. *Which is not demonstrat.*

“ From which it follows (says he) that
 “we are more certain of things that are
 “demonstrat, than of any thing that de-
 “pends upon the Faith of History.

“ 2. That we are more certain of these
 “things we know by our Senses, than of
 “any thing we know only by History:
 “And therefore that an Argument taken
 “from History is of no force against things
 “that are demonstrat, or perceived by our
 “Senses.

“ 3. That we can never be so certain
 “of

“ of any History as the Authors of it. Nor
 “ so certain of an old History as a late.

Now if you consider the Matter well, you shall find that this Doctrine strikes at the Root, and shakes the Foundation of all historical Certainty, whether the History be Sacred or Profane: For the one as well as the other supposeth and takes for granted the Second and Third *Effatum*, (according to the Doctor) that is, it supposeth something to be true, which for any thing we know is false, and consequently the Belief that is built on it; for such as the Foundation is, such will the Building be: And every Body knows that Conclusions have the same kind of Certainty, with the Principles themselves from which they are deduced: For Truth like Water will rise no higher than its Fountain. But I shall examine his Conclusions one by one, and show you how Sound and Solid, *i.e.* how Senseless and Ridiculous they are.

The First is not only Pernicious and Absurd, but down-right Nonsense: For it is contrary to Sense and Reason, and the common Sentiments of Mankind, *viz.* that

I cannot be so certain of any Matter of fact of which I was not a Witness, as of a Demonstration, as indeed some Matters of fact were not as capable of being demonstrated their own way, as any Proposition in *Euclid*; and which we can no more doubt of, nor disbelieve, than we can of Problems about Lines or Numbers, without doing manifest violence to our own Convictions. For they carry such an Evidence along with them, as determines almost necessarily our Assent, and which no unprejudiced Mind can withstand, tho it is possible that Malice and Peevishness may defeat their efficacy: And so it may too, if it please, over-rule the Power of Mathematical Demonstration: Which if it thwarted Mens Lusts, and crossed their vicious Inclinations, would meet with as much Contradiction as Moral Demonstration does.

Have not these that have writ of the truth of the Christian Religion, as clearly demonstrated that there was such a one as *CHRIST JESUS*, Who was Crucified at *Jerusalem*, rose again from the Dead,

Dead, &c. as any thing can be : Matters of fact that the greatest Adversaries to the Truth never had the impudence to deny. It was good luck that *Celsus* and *Porphyrie* and the rest of that gang, were not learned enough in the Mathematicks, to find out this flaw of the *Non demonstrata*. For it had been easie for them to have stopt the Mouths of their Adversaries thus. This History which you believe supposes and takes for granted some things to be true, which may be false, a cheat and lie, such as no wise Man would trust his Life and Fortune to, much less his highest and greatest concern. Thus you see what a brave thing it is to be *Troppo Mathematico*.

The 2. Conclusion is all of a piece with the first, equally Pernicious, Absurd and Ridiculous. For according to it I can never be so certain that ever there was such a Man as King *James* the Sixth, or *Charles* the First, as if I had seen them. From which also it follows, that no Man can ever be certain that he was born of a Woman; yea for ought he knows, he was

was hatched under a Hen, or grew out of the Ground like a Cabbage; which is so ridiculous, that a Child of Ten Years old would refute it, from the Principles of common Sense. Let me suppose then a Dialogue between some learned Mathematician and this Child.

Math. Come hither my pretty little Rogue, prethee tell me, was thou born of a Woman? *Child.* What does think that I was hatched under a Hen, or grew out of the Ground like a Cabbage. *Math.* For any thing, Child, you know it is so. *Ch.* For any thing I know you are Hypochondriack. *Math.* Hold your peace, Child, did you see your self born. *Ch.* If I did, I do not remember. *Math.* How then do you know that you was born of a Woman? *Ch.* How do I know? Marry my Father and Mother, and all the Neighbour-hood told me so much; are not all Children born of Women? *Math.* That is the Question Child. Is any Body alive that saw you born? Or has any Body writ the History of your Birth. *Ch.* I know nothing of all that. *Math.* Then
Child

Child many things being alledged here to to be certain that are not demonstrat, and so may be false, you can never be certain you was born of a Woman. As *First*, That these who pretend they saw you born, had so much honesty, as to tell nothing but the Truth: Which is not demonstrat according to the 2. *Effatum*. Secondly, Supposing the Witnesses are dead, that these who heard it from them, told it to others just as they heard it: Which is not demonstrat according to the 3. *Effatum*. Thirdly, There being no written History of your Birth, but only Tradition, you must suppose the Memories of those by whom you pretend to know the thing, to be so faithful, that they forgot nothing of the whole Matter: Which is not demonstrat according to the 4. *Effatum*. Now all these being supposed for true, which nevertheless may be false, it may be you have been hatched under a Hen, or grown up like a Cabbage, or dropt from a Tree like a Bernacle or Cleg-goose; and therefore Child take heed you fall not into the Hands of some *French Papist*,

who may eat you on a Fish-day for a *Ma-creuse*, without transgressing the Rules of his Church, which no doubt has the same power to make Flesh Fish, that it has to make Bread Flesh. And tho you should escape this, yet either *Protestant* or *Papist* may make a Dish of Cabbage of you, or a Fricasie of Chickens. Ch. I thank you for your Advice: But in the mean time take you care not to fall into the Hands of the Keepers of *Bedlam*, who, if they catch you, will certainly lock you up for a Mad-man.

The *Third* Conclusion is a wedge of the same Timber, every whit as senseless as the former. For I can be as sure of the truth of some Histories, and Thousands of Matters of fact, as I had been an Ear and an Eye Witness, and the First Authors could pretend to no more. Do not I know as certainly that there is such a Place as *Rome* or *Constantinople*, and that the one is the Seat of the *Pope*, and the other the Residence of the *Grand Signor*, as if I had seen them with my Eyes, and this is so evident, that one would be taken

for a Mad-man that would call it in question.

And for the Antiquity of a History, it is the first time that ever I heard, that it derogates any thing from the Credit of it. It is not the oldness of the History that lessens its Credibility, but its being weakly attested in the beginning: the small Authority it had decays with Time, that tries all, and at last may chance to perish and die. But a History that has been well attested in the beginning, and has set up upon a sufficient stock of Authority, will never crack its Credit, nor prove Bank-rupt with time, but rather

Mobilitate viget, viresq; acquirit eundo.

Time is the best *Index Expurgatorius*, to discover what is false and fictitious, and what is certain and true. *Opinionum commenta delet dies: Naturæ judicia confirmat*, saith Cicero. Many Writings have pass'd for genuine, which time has discovered to be spurious. And many Men have been thought both Learned and Honest, who at last have been found to be

meer Dunces and very Rogues. *Nemo potest diu personam ferre. Ficta in naturam suam cito recidunt.* Sen. de Clement.

Et redit in nihilum quod fuit ante nihil.

From this Position of the Doctor's it clearly follows, that I cannot be so certain of an History writ Sixteen Hundred Years ago (much less of one that is of Three Thousand Years standing) as of one writ Sixty Years ago. How solid and sound this Conclusion is, I leave to the Divines to determine.

If what I have said be true, what will become of the Doctor's Oracles, which all historical Certainty supposeth? Let them even undergo the Fate of all lying Oracles.

Et Diris cæcas remeare sub umbras;
And so return to the Place from whence they came. And I am sure the Doctor will approve the Condemnation of these Criminals, who have not only kill'd Historical Truth, but basely murdered Mathematical, by stabbing it to the very Heart.

Heart. For Mathematical Certainty, as well as Historical Supposes some *Non demonstrata*, and consequently, according to the Doctor, must labour under some degree of Uncertainty, and so all Mathematical Demonstrations will at best prove nothing but high Probabilities. For the Truth and Certainty of a Mathematical Demonstration, especially if it be such as depends on a long train of forgoing Propositions, which again must depend on so many Definitions, Axioms and Postulats, supposeth things that are not, and cannot be demonstrat (according to the Doctor) and so must take up its Quarters with poor miserable Historical Certainty. But it is

Solamen miseris socios habuisse doloris.

To illustrat the Truth of what I say, I shall bring an Example that is beyond all exception. There is nothing more frequent and ordinary, than to say, That a thing is as certain as, that *the three Angles of a Triangle are equal to two right Angles*. And yet as certain as it is, it

poseth some things that are not demonstrat, *viz.* That the Judgement and Memory of one that pronounces this as certain, is infallible, and no ways subject to mistake. For since no Man can have an intuitive knowledge, of all the forgoing Propositions, Axioms and Postulats, on which this Conclusion depends, (which tho he had, is but fallible at best) and an objective Evidence of their Truth, all at one view, he must content himself to remember, that he once knew them, and trust his poor frail Memory for all, which frail as it is he must suppose to be infallible, before he can have such an assurance of this Truth, as excludes all doubting: And so Mathematical Certainty must stand upon the same bottom with Historical: And consequently either Historical Truth must be as certain as Mathematical, or Mathematical as uncertain as Historical.

It is nothing to the purpose that some object, That many Fables and Fictions have passed for true, and many such are believed and inrertained in the World to this day as certain, that are meer idle Tales
and

and Stories. For this is no more prejudicial to Historical Certainty, than it is to Mathematical, that not only Probabilities but Paralogisms; yea even some Dreams pass current for Demonstrations. Nor is it of any more force what others alledge, that Historical Truth has as much Certainty as it is capable of, but it is no more but Historical still. Historical Certainty it is, but Historical Certainty is as certain in its kind, as Physical or Mathematical are in their kinds; and the Certainty of the one derogates no more, from the other, than the Certainty of Seeing from the Certainty of Hearing: For tho I cannot see with my Ears, nor hear with my Eyes; yet both Hearing and Seeing are equally certain, tho of different kinds, and I can be as infallibly certain I hear a Sound, as that I see a Colour.

Much more might be said on this subject, did not its own native Evidence and Perspicuity supersede any further Proof or Illustration thereof. And what I have said is sufficient to convince any unprejudiced Mind. As for those who are resol-

ved to be humorfome and wilful, and smother the greateſt Convictions, and ſtifle the cleareſt Evidence, it were in vain to attempt to convince ſuch by Reason, who ſtand more in need of Helebor: which if they reſuſe (for ſome mad Folks will take nothing by the Mouth) the wiſe Solomon has left us an excellent Receipt, *A whip for the Aſſ, a bridle for the Horſe, and a rod for the Fools back.* And yet I muſt confeſs that ſome of thoſe poor Creatures deſerve rather Pity than Punishment, and want more the Prayers of the Church, than the Sword of the Magiſtrat, for their Recovery; for it were breach of Charity to think they were not ſick of that Diſeaſe the Phyſicians call, *Delirium ſine febre.* For how can we imagine, that any but theſe that have not the exerciſe of their Reason, will deny the moſt manifeſt Truths, and give themſelves over to believe Lies? And ſet up for great Philoſophers and deep Clerks, becauſe they can break two or three dull Jeſts on the Scripture, and pretend to answer the ſtrongeſt Arguments with ſome pitiful Repartee, which

which beside that it is void of Reason, has scarce wit enough to tempt any Man to laugh beside themselves. But what to say of these Mens Admirers I know not; all the difference I know between them is, that the first for the most part are incurable, and the last incorrigible Fools, being of that kind, whom tho you bray in a Mortar, yet will not their Folly depart from them.

I have now done, and (if I am not mistaken) have sufficiently vindicat the Truth from a Lie, and Physick and Physicians from the groundless Aspersions and false and mistaken Notions of these Mathematical Quiblers, who will needs turn the World upside down, and remove the ancient Land-marks our Fathers have set. And I am sure whoever blame me for this, my learned Adversary owes me Thanks, for opening his Eyes, and leting him see how injurions the *Learned Mob* has been to him. For what greater Injury can be done to one, than to make him believe, that Buffonry is Wit, Pedantry Learning, and stark Nonsense the sublimest Eloquence,

quence, and idle Dreams Mathematical Demonstrations? But I am affraid I have been working to an unthankful Master, whose weak Eyes cannot indure the Light; and it may be in place of that which I expected, I shall meet with the quite contrary, and be challenged as an Accuser of the Brethren of false Citations and Translations and what not? Which is all the Answer I expect, and which no Body in reason can blame. For Nature, when it can do no better, will struggle, and the *Ultimus Naturæ conatus* was never condemned by any Law; yea even these *Qui exeunt cum crepitu*, are excusable.

F I N I S.

E R R A T A.

Pag. 18. for eas, read eos. Pag. 19. for Demonstrevero, Demonstravero. Pag. 30. for way, ways.

